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OBSERVATIONS OF SEAWATER TEMPERATURE AND SALINITY AT BRITISH COLUMBIA SHORE STATIONS 1972



by
H.J. Hollister

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Marine Sciences Directorate
Pacific Region
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PACIFIC MARINE SCIENCE REPORT NO.74-1

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Environment Canada

March, 1974

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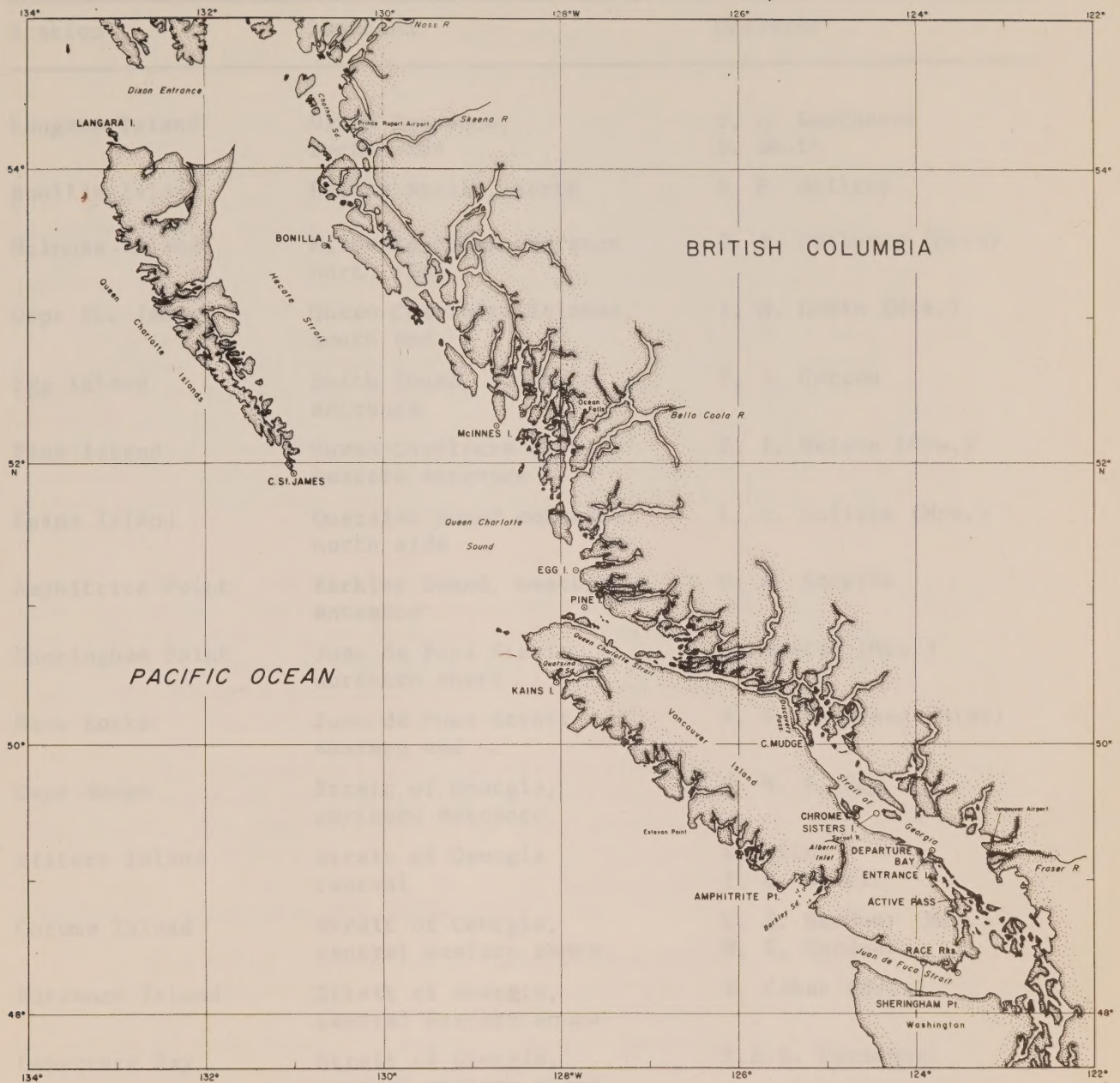


Fig. 1. Locations of shore stations making daily oceanographic observations in 1972.

Table 1. List of stations making oceanographic observations in 1972.
locations, and names of observers.

Station	Location	Observer
Langara Island	Dixon Entrance, south side	S. G. Westhaver D. Smith
Bonilla Island	Hecate Strait, north	W. F. McIlroy
McInnes Island	Milbanke Sound entrance north side	D. S. Collette (Miss)
Cape St. James	Queen Charlotte Islands, south end	J. M. Godin (Mrs.)
Egg Island	Smith Sound, southern entrance	E. R. Carson
Pine Island	Queen Charlotte Strait western entrance	M. I. Nelson (Mrs.)
Kains Island	Quatsino Sound entrance, north side	L. C. Collins (Mrs.)
Amphitrite Point	Barkley Sound, western entrance	O. A. Edwards
Sheringham Point	Juan de Fuca Strait northern shore	E. Bruton (Mrs.)
Race Rocks	Juan de Fuca Strait eastern end	A. A. Anderson (Miss)
Cape Mudge	Strait of Georgia, northern entrance	C. W. A. Egg
Sisters Island	Strait of Georgia central	W. Milne I. G. McNeil
Chrome Island	Strait of Georgia, central western shore	L. E. Gardner (Mrs.) W. E. Gardner
Entrance Island	Strait of Georgia, central western shore	E. Cihak (Mrs.)
Departure Bay	Strait of Georgia, central western shore	F.R.B. Personnel
Active Pass	Strait of Georgia, southwestern shore	J. E. Ruck

Observations of Seawater Temperature and Salinity

at British Columbia Shore Stations in 1972

by

H. J. Hollister

Introduction

Daily observations of sea surface temperature and salinity have been made since the early 1930's at numerous locations along the British Columbia coast. During 1972, observations were made at 16 shore stations (Fig. 1). Table 1 lists the stations in a north to south order, their general locations, and the names of the observers. This data report presents the daily temperatures and salinities, their maximum and minimum and standard deviation in each month, and the monthly and annual means. Also included in the report are graph plots of a 7-day, normally-weighted running mean of temperature and salinity. The monthly mean temperatures and salinities are summarized in Tables 2 and 3. A bibliography of papers and reports and a list of previous data records are contained in a report by Hollister and Sandnes (1972), which give the monthly and annual mean temperatures and salinities for the period 1914-1970.

Most of the stations are at lightstations, and the voluntary services of the lightkeepers as observers have been obtained by arrangement with the Ministry of Transport. The Cape St. James station is a combined radiobeacon and meteorological station, and the services of the staff were obtained with permission of the Regional Director, AES*. The observers receive a payment for their work.

The station data listings are arranged in the same order as in Table 1. The position coordinates of each location are recorded on the data pages. The temperature and salinity graph plots are in the second section of the report.

Observation procedures and equipment

The daily observation is made within one hour before the time of the daytime high tide, or as close as possible to this time, depending upon weather conditions and lightkeeping duties. There is one exception to this rule. At Active Pass the observations were made at highwater slack, according to the times listed in the Tide Tables.

The observations are made at a depth of 3 feet. Seawater temperatures are measured with a Fahrenheit mercury thermometer graduated in 0.5 degree intervals from 30 to 85°F, and are read to 0.1 degree. The maximum index scale error is $\pm 0.3^\circ\text{F}$. The thermometer is mounted in a protective case.

* Atmospheric Environment Services.

A 25-oz seawater sample is collected at the same time as the temperature observation for use in measuring the density with a hydrometer. The hydrometers are similar to those used by the U.S. Coast and Geodetic Survey at their tide stations, and the hydrometer reading techniques are the same as those described in the U.S.C. & G.S. Hydrographic Manual (Adams 1942). The hydrometers have been calibrated, and corrections are applied to the readings.

The time of daily observation, seawater temperature, and hydrometer reading are recorded on monthly record sheets, which are mailed to the Pacific Environment Institute at West Vancouver, B. C.

Accuracy of the data

Sea temperatures are listed in the data record as reported by the observer. Data are deleted only when it is discovered that a faulty thermometer has been used. The limit of accuracy of individual readings would be $\pm 0.3^{\circ}\text{F}$. The hydrometer readings are reduced to densities at 15°C , using the tables in the report of Zerbe and Taylor (1953). The reduced densities are converted to salinity values. Field comparisons have shown that 85% of the hydrometer salinity data matched associated salinometer-determined values within 0.3 ppt. Abnormal salinity values were eliminated from the data listing when they were obviously due to incorrect hydrometer reading.

Machine processing of the data

The daily temperature and salinity data are processed by computer at the Marine Environmental Data Service at Ottawa, Ontario. The pages in the report are direct-image copies of the computer output.

For each month's data, the monthly mean temperature and salinity and the standard deviation of the daily observations are computed. The monthly means are rounded off at the reported decimal place. The standard deviation (STD DEV) values have been truncated at the second decimal place. The OBSVNS line lists the number of true observed data in each month's tabulations. Annual mean temperature and salinity are listed in the October-November-December page on the YRLY MEANS line.

A 7-day, normally-weighted, running mean of the daily data is calculated (Holloway, 1958). An automatic plot of these means is made at the Data Centre. The graphs presented in this report are copies of these plots, reduced to page size. So that the running mean will be reasonably continuous, interpolated values are inserted in 1- and 2-day missed periods. These interpolated values are indicated in the daily data tabulations by an asterisk preceding the number. Periods of more than 2 days of missed data are indicated by a *0.0 entry in the tabulations. The running mean computations are interrupted by this entry and there is a break in the graph plot. Invalid days such as April 31 are indicated in the tabulations by a 0.0 entry. A copy of the running means calculations is available from West Vancouver.

Acknowledgements

I am very grateful to the observers for their hard work and cooperation. They maintained a remarkable continuity in the data, despite stormy weather and often hazardous conditions at the sampling locations. Excellent assistance was received from the District Managers and staffs of the Marine Transportation Division, Ministry of Transport, in Victoria and Prince Rupert, as well as from the M.O.T. Radio Branch, who transmitted numerous messages concerning the program.

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- Holloway, J.L. jr., 1958: Smoothing and filtering of time series and space fields. Advances in Geophysics, Vol.4, pp.351-389.
- Hollister, H.J., A.M. Sandnes, 1972: Sea surface temperatures and salinities at shore stations on the British Columbia coast, 1914-1970. Victoria, Marine Sciences Directorate. Pacific Marine Science Report 72-13.
- Zerbe, W.B., C.B. Taylor, 1953: Sea water temperature and density reduction tables. U.S. Coast and Geodetic Survey. Special Publication No.298.

Table 2. Monthly and annual mean temperatures (C) in 1972.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Langara I.	4.3	4.3	4.6	5.4	7.2	8.8	9.9	12.4	11.2	9.8	8.7	6.6	7.7
Bonilla I.	4.4	4.4	5.4	6.2	8.8	10.7	11.7	12.3	10.8	9.4	7.9	6.5	8.3
McInnes I.	4.9	4.8	5.6	6.4	8.5	10.6	12.7	13.6	11.1	8.8	7.6	6.4	8.4
Cape St. James	5.2	5.2	5.8	6.8	8.2	9.4	11.7	12.9	12.6	9.8	8.2	7.6	8.8
Egg I.	5.4	5.6	6.5	7.1	9.3	11.0	12.5	13.3	10.5	8.6	7.7	6.6	8.7
Pine I.	6.1	5.7	6.3	6.7	7.9	8.7	9.7	9.9	9.0	8.3	8.1	7.4	7.8
Kains I.	5.8	5.8	6.6	7.6	9.5	11.3	12.9	13.2	11.6	10.0	8.6	7.2	9.2
Amphitrite Pt.	6.4	5.9	7.9	8.4	10.3	11.4	13.0	13.8	12.4	10.5	9.2	7.9	9.8
Sheringham Pt.	6.4	6.2	7.1	7.7	9.3	9.9	10.7	11.6	10.7	9.4	8.6	7.7	8.9
Race Rocks	6.5	6.3	6.9	7.7	8.8	9.6	10.6	10.7	10.3	9.2	8.4	7.4	8.6
Cape Mudge	6.2	6.6	7.8	8.3	10.7	13.8	15.3	14.1	11.4	9.4	8.4	6.7	10.1
Sisters I.	6.1	6.1	6.8	7.8	11.7	15.3	16.2	17.9	13.6	10.3	8.4	6.9	10.6
Chrome I.	6.1	6.3	7.0	7.7	11.2	14.4	15.6	18.5	13.5	10.3	8.4	7.2	10.5
Entrance I.	6.6	6.1	7.0	7.5	12.1	14.8	15.1	18.6	13.7	10.4	8.3	7.1	10.6
Departure Bay	5.7	6.3	6.9	7.7	13.1	15.5	16.2	19.0	13.6	10.7	8.1	6.8	10.8
Active Pass	5.6	5.9	6.8	7.9	10.9	12.7	14.4	16.2	12.5	10.0	8.3	6.8	9.9

Table 3. Monthly and annual mean salinities (ppt) in 1972.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Langara I.	32.2	32.0	32.0	32.0	31.9	31.5	31.7	32.1	32.1	32.5	32.3	32.5	32.1
Bonilla I.	30.9	31.1	31.2	30.9	30.8	30.8	30.7	30.9	31.1	31.0	30.7	31.3	31.0
McInnes I.	30.7	30.8	30.0	29.3	28.5	28.7	28.6	29.5	30.0	29.8	29.7	30.5	29.7
Egg. I.	31.8	32.0	31.1	30.5	29.7	28.9	29.6	29.6	31.7	32.2	31.8	32.0	30.9
Pine I.	31.5	31.6	30.9	30.8	31.6	31.5	31.2	31.5	31.8	31.8	31.8	31.6	31.5
Kains I.	30.3	29.9	28.3	28.3	29.7	31.2	32.1	32.1	31.7	31.8	30.4	29.8	30.5
Amphitrite Pt.	29.1	27.5	25.2	27.9	29.9	31.0	38.9	30.9	30.6	30.6	29.6	29.0	29.2
Race Rocks	31.0	30.9	30.0	30.3	30.7	30.3	29.8	30.4	30.8	31.3	31.8	31.5	30.7
Cape Mudge	29.1	29.5	29.0	28.9	29.0	25.8	25.2	26.8	28.2	29.1	29.4	29.3	28.2
Sisters I.	29.2	29.3	27.7	27.2	27.0	20.9	22.8	24.3	26.8	28.2	28.7	29.1	26.8
Chrome I.	28.8	29.1	28.2	28.3	27.4	24.7	24.1	25.0	27.4	28.5	29.1	28.9	27.5
Entrance I.	28.5	28.5	27.2	27.2	25.7	20.6	23.0	23.3	26.3	27.6	28.0	28.3	26.2
Departure Bay	27.9	26.7	23.9	26.0	25.2	20.8	23.4	24.0	26.6	28.1	27.5	25.6	25.5
Active Pass	28.9	28.9	27.9	28.4	23.2	20.6	22.7	22.3	26.3	28.1	28.6	28.9	26.2

Tabulations of Daily Sea Surface
Temperature and Salinity

1972

TEMP: Temperature °F

SAL: Salinity ppt

LANGARA ISLAND

54 15 19 N

133 03 30 W

JANUARY

FEBRUARY

MARCH

1971

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	41.5	32.1	39.0	31.9	38.2	32.5
2	41.5	32.3	38.9	32.1	* 38.2	* 32.5
3	41.2	32.0	39.2	32.4	38.2	32.5
4	41.2	32.0	39.6	32.3	39.2	31.9
5	41.5	32.3	40.0	31.9	38.7	31.9
6	41.6	32.4	40.5	32.1	38.4	32.1
7	41.0	32.5	39.9	32.0	* 0.0	* 0.0
8	41.5	32.3	40.2	32.0	* 0.0	* 0.0
9	41.2	32.1	40.0	32.0	* 0.0	* 0.0
10	* 40.2	* 31.9	39.5	31.9	39.5	31.5
11	39.3	31.8	40.0	32.0	39.5	31.9
12	38.8	32.0	40.2	31.9	39.7	32.3
13	39.5	31.8	39.9	32.0	40.3	31.8
14	40.5	32.0	40.0	32.1	* 40.8	* 31.7
15	40.9	31.6	* 39.8	* 32.1	41.3	31.6
16	39.5	32.0	39.5	32.1	40.9	32.0
17	39.0	32.1	39.2	32.0	41.5	31.6
18	39.5	32.3	40.5	32.0	41.4	31.8
19	40.0	32.3	40.9	32.0	41.0	32.0
20	39.5	32.3	40.5	32.0	41.5	31.9
21	38.8	32.5	40.2	32.0	41.6	32.1
22	39.0	32.4	40.0	32.1	41.4	32.0
23	38.5	32.4	39.2	31.9	39.7	31.6
24	38.0	32.3	39.0	31.8	40.0	31.8
25	37.9	32.4	39.2	31.9	40.9	31.8
26	37.5	32.4	* 39.1	* 31.9	40.9	32.4
27	38.2	32.5	39.0	31.9	40.7	32.0
28	39.6	32.3	39.5	31.8	41.4	32.1
29	39.0	32.1	37.2	32.0	41.4	32.7
30	39.5	32.3	0.0	0.0	40.6	32.3
31	38.5	32.4	0.0	0.0	40.2	32.1
MEANS	39.8	32.2	39.7	32.0	40.3	32.0
OBSVNS.	30	30	27	27	26	26
MAXIMUM	41.6	32.5	40.9	32.4	41.6	32.7
MINIMUM	37.5	31.6	37.2	31.8	38.2	31.5
STD.DEV.	1.27	.23	.74	.13	1.11	.70

LANGARA ISLAND

54 15 19 N

133 03 30 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	40.7	32.1	43.3	31.8	47.4	32.0
2	41.4	32.1	43.2	32.3	46.9	32.0
3	41.5	31.8	43.3	31.8	47.7	31.9
4	41.5	31.9	44.0	31.9	47.0	31.5
5	41.6	32.0	45.3	31.9	46.9	31.4
6	40.7	32.3	46.4	31.9	47.3	31.4
7	* 40.6	* 32.2	45.9	31.9	46.8	31.6
8	40.5	32.0	44.5	31.9	47.3	31.6
9	40.8	32.3	44.3	31.9	47.3	31.9
10	40.7	32.3	44.6	32.0	47.9	31.8
11	40.8	32.3	44.3	31.6	46.9	31.9
12	41.5	32.0	45.0	31.8	47.6	31.9
13	41.7	32.0	45.3	31.6	48.1	31.4
14	41.5	31.9	45.9	31.4	* 48.5	* 31.7
15	41.7	32.1	45.9	31.5	48.9	32.0
16	42.0	32.1	44.8	31.8	48.9	31.8
17	41.9	32.1	46.1	31.8	* 49.2	* 31.3
18	42.0	31.6	45.4	32.0	49.6	30.8
19	41.9	31.8	* 45.4	* 31.8	48.3	31.1
20	41.6	32.1	45.4	31.6	48.3	31.6
21	40.7	32.1	* 45.0	* 31.8	48.2	30.7
22	41.2	32.4	44.5	32.0	48.7	31.0
23	41.6	32.4	44.7	32.1	47.7	30.8
24	42.3	32.1	45.4	32.1	47.9	30.8
25	42.6	32.1	45.3	32.1	48.1	31.0
26	42.8	31.6	45.3	32.1	47.4	32.0
27	42.8	31.8	45.6	32.0	47.5	31.8
28	43.0	31.8	45.9	31.9	48.4	31.2
29	43.3	31.9	45.9	31.9	48.9	31.8
30	42.9	31.8	* 44.8	* 32.0	* 49.0	* 31.6
31	0.0	0.0	43.7	32.0	0.0	0.0
MEANS	41.7	32.0	45.0	31.9	47.8	31.5
OBSVNS.	29	29	28	28	27	27
MAXIMUM	43.3	32.4	46.4	32.3	49.6	32.0
MINIMUM	40.5	31.6	43.2	31.4	46.8	30.7
STD.DEV.	.78	.22	.90	.20	.74	.43

LANGARA ISLAND

54 15 19 N

133 03 30 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	49.1	31.5	50.4	31.8	57.4	32.0
2	49.4	31.6	51.1	31.6	55.6	32.0
3	49.2	31.2	52.8	31.6	55.4	32.0
4	49.0	31.4	52.7	31.1	54.8	31.8
5	49.4	31.5	52.8	31.5	54.6	32.0
6	49.3	31.8	53.6	32.0	* 54.0	* 32.0
7	49.3	31.5	54.0	31.8	53.3	32.1
8	48.8	31.6	54.5	31.8	53.8	32.3
9	49.3	31.5	54.1	32.3	* 53.8	32.4
10	49.3	32.3	54.1	31.9	53.7	32.5
11	48.9	32.5	54.0	32.0	53.3	32.4
12	49.0	32.1	54.0	32.1	53.1	32.1
13	49.4	32.5	53.1	32.1	53.0	31.8
14	49.9	32.4	53.5	32.0	52.4	31.6
15	50.3	32.0	54.5	32.5	54.2	31.8
16	* 50.8	* 32.0	55.6	32.4	53.3	31.8
17	51.2	31.9	56.2	32.1	53.2	31.5
18	* 51.0	* 31.4	54.6	32.5	50.4	32.3
19	50.8	30.8	56.2	32.4	* 49.6	* 32.2
20	53.9	30.7	* 55.9	* 32.2	48.7	32.0
21	* 50.3	* 31.0	55.6	31.9	48.0	32.1
22	49.7	31.2	55.3	32.5	48.3	32.3
23	50.3	31.2	53.3	32.1	48.7	32.5
24	50.7	32.5	* 54.1	* 32.2	48.8	32.0
25	50.0	32.0	54.9	32.4	48.8	32.5
26	50.4	31.8	55.8	32.4	49.0	32.7
27	50.9	32.1	54.6	32.7	48.2	32.3
28	51.1	31.6	55.8	32.0	* 49.3	* 32.3
29	51.3	31.9	56.1	32.4	* 50.5	* 32.3
30	50.1	32.0	* 56.2	* 32.2	51.7	32.3
31	51.3	31.8	56.4	32.0	0.0	0.0
MEANS	49.9	31.7	54.3	32.1	52.1	32.1
OBSVNS.	28	28	28	28	25	26
MAXIMUM	51.3	32.5	56.4	32.7	57.4	32.7
MINIMUM	48.8	30.7	50.4	31.1	48.0	31.5
STD.DEV.	.82	.48	1.50	.36	2.78	.30

LANGARA ISLAND

54 15 19 N 133 03 30 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.4	32.5	48.9	32.1	45.7	32.1
2	51.8	32.0	48.5	32.2	44.0	32.8
3	51.4	32.4	47.9	32.3	44.4	33.0
4	50.0	32.1	48.8	32.1	44.3	33.0
5	50.9	32.1	48.0	32.3	43.7	32.9
6	51.7	32.8	48.0	32.5	43.4	33.0
7	50.9	32.8	47.5	32.5	43.5	32.8
8	50.0	32.4	* 47.8	* 32.2	44.3	32.1
9	49.0	32.7	48.2	32.0	43.5	32.8
10	49.8	32.5	47.9	32.4	44.4	32.5
11	49.5	32.9	48.8	32.5	43.7	32.1
12	49.0	32.5	48.4	32.4	43.7	32.1
13	48.7	32.4	48.3	32.1	* 43.6	-0.0
14	49.0	32.4	47.8	32.1	43.4	31.8
15	49.2	32.7	47.8	32.3	43.8	31.4
16	* 48.9	* 32.6	47.4	32.5	43.3	32.5
17	48.6	32.4	46.5	32.3	43.4	32.3
18	49.1	32.3	46.6	32.1	44.0	32.4
19	49.6	32.9	46.8	32.3	43.8	32.4
20	49.0	32.3	47.8	32.5	44.0	32.3
21	48.5	32.3	48.4	32.4	43.8	32.4
22	49.4	32.4	48.5	32.4	42.3	32.3
23	* 49.6	* 32.4	48.2	32.1	43.8	32.8
24	49.7	32.4	47.5	32.5	44.2	32.8
25	49.5	32.5	* 47.4	* 32.3	43.8	32.5
26	48.5	32.7	47.4	32.1	43.8	32.1
27	47.0	32.9	46.4	32.3	* 44.0	* 32.2
28	* 47.6	* 32.7	46.0	32.0	* 44.2	32.3
29	* 48.2	* 32.5	46.7	32.1	44.4	32.4
30	48.8	32.3	46.8	32.0	44.8	32.5
31	48.8	32.4	0.0	0.0	43.7	32.7
MEANS	49.6	32.5	47.7	32.3	43.9	32.5
OBSVNS.	27	27	28	28	28	29
YRLY. MEANS.....					45.9	32.1
MAXIMUM	51.8	32.9	48.9	32.5	45.7	33.0
MINIMUM	47.0	32.0	46.0	32.0	42.3	31.4
STD.DEV.	1.14	.25	.80	.18	.59	.38

BONILLA ISLAND

53 29 39 N

130 38 00 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 42.2	* 30.8	38.5	31.1	39.8	31.4
2	41.8	30.7	38.6	31.1	39.6	31.6
3	41.0	30.4	38.2	31.4	40.4	31.5
4	41.8	31.0	39.0	30.8	39.8	31.1
5	42.0	30.7	38.8	31.1	40.0	30.8
6	* 42.0	* 30.6	40.0	30.4	40.7	31.5
7	42.0	30.4	40.3	30.7	40.8	31.2
8	* 41.8	* 30.5	41.0	31.0	40.0	31.2
9	41.5	30.7	* 40.6	* 31.1	* 40.6	* 31.1
10	41.5	30.7	40.3	31.2	41.2	31.0
11	41.0	30.4	40.0	31.0	41.2	30.8
12	40.0	31.1	40.0	30.7	41.5	30.8
13	37.5	31.5	41.2	31.2	41.5	31.4
14	39.5	30.7	40.7	31.0	42.5	31.2
15	41.4	30.6	40.4	31.2	42.0	30.8
16	41.5	30.7	40.8	31.2	43.0	31.2
17	40.8	31.0	40.9	31.5	42.8	31.1
18	41.0	30.7	40.5	31.5	42.6	31.4
19	40.4	30.7	* 40.6	* 31.4	43.2	31.1
20	39.9	30.8	40.6	31.2	43.4	31.5
21	38.8	31.1	41.2	31.5	43.2	31.1
22	38.5	31.4	41.0	31.5	42.8	31.5
23	38.5	31.1	40.2	31.1	42.9	31.1
24	37.5	31.2	39.0	31.1	41.7	31.0
25	37.5	31.2	38.0	31.1	41.5	31.2
26	* 37.4	* 31.1	38.0	31.4	42.2	31.4
27	* 37.3	* 30.9	40.0	31.1	42.5	31.1
28	37.2	30.8	39.8	31.4	43.0	31.1
29	37.4	31.1	40.6	31.4	44.2	31.8
30	38.8	30.6	0.0	0.0	42.2	31.4
31	39.0	31.1	0.0	0.0	42.6	31.6
MEANS	39.9	30.9	39.9	31.1	41.8	31.2
OBSVNS.	26	26	27	27	30	30
MAXIMUM	42.0	31.5	41.2	31.5	44.2	31.8
MINIMUM	37.2	30.4	38.0	30.4	39.6	30.8
STD.DEV.	1.65	.30	1.02	.27	1.25	.26

BONILLA ISLAND

53 29 39 N

130 38 00 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.8	31.6	44.2	30.4	51.6	31.1
2	43.8	31.4	45.4	30.8	49.3	31.2
3	45.5	31.6	45.8	30.6	50.6	31.1
4	42.7	30.7	49.4	31.1	50.9	31.1
5	42.2	30.6	52.0	31.8	49.8	30.7
6	41.9	30.7	50.8	30.8	49.4	31.0
7	41.2	30.2	49.6	31.0	49.3	30.7
8	42.0	30.6	47.6	31.0	50.4	31.1
9	42.8	30.8	47.2	31.0	51.0	30.8
10	41.2	30.7	46.0	30.6	50.5	30.7
11	41.2	30.7	46.2	30.8	50.7	31.0
12	43.0	31.0	46.3	30.3	51.0	31.2
13	43.2	30.7	46.8	30.2	52.6	31.4
14	42.8	31.0	49.2	30.4	51.0	30.7
15	43.6	31.0	46.8	30.4	51.9	31.1
16	43.5	30.7	48.2	30.8	52.6	30.8
17	43.2	30.8	48.6	31.0	54.5	31.1
18	43.3	30.6	48.5	31.0	52.7	30.8
19	43.7	31.0	49.7	30.8	50.8	30.8
20	43.8	31.0	48.9	31.2	49.5	30.7
21	44.0	30.7	46.4	30.6	48.8	30.4
22	43.0	30.8	46.8	30.8	51.2	30.6
23	43.0	31.2	47.5	30.7	50.6	30.7
24	44.0	30.7	48.0	30.4	49.0	30.7
25	43.7	31.2	46.6	30.6	51.7	30.3
26	43.8	30.7	47.4	31.0	50.0	29.9
27	44.2	30.7	48.1	31.0	52.5	29.9
28	44.8	31.0	48.2	31.1	54.4	30.4
29	45.2	30.8	48.3	30.7	52.9	30.6
30	43.8	30.7	48.6	31.0	54.4	30.4
31	0.0	0.0	50.2	31.1	0.0	0.0
MEANS	43.2	30.9	47.8	30.8	51.2	30.8
OBSVNS.	30	30	31	31	30	30
MAXIMUM	45.5	31.6	52.0	31.8	54.5	31.4
MINIMUM	41.2	30.2	44.2	30.2	48.8	29.9
STD.DEV.	1.07	.30	1.69	.33	1.58	.36

BONILLA ISLAND

53 29 39 N

130 38 00 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	53.6	30.7	54.2	30.7	53.6	30.8
2	54.8	31.4	53.4	30.8	52.8	30.8
3	53.5	31.1	51.8	30.6	52.5	31.1
4	52.8	30.6	52.5	30.3	51.4	31.1
5	51.5	30.8	52.0	30.4	50.5	31.4
6	51.6	30.8	54.1	30.6	50.0	31.0
7	52.8	30.7	55.8	30.7	51.0	30.8
8	50.2	31.0	53.8	30.8	51.6	31.5
9	52.0	31.1	55.2	30.8	50.8	31.1
10	52.8	31.4	53.8	31.0	53.8	31.4
11	51.6	31.4	54.2	30.7	52.0	31.4
12	51.2	30.6	52.4	31.1	51.8	31.0
13	53.2	30.7	51.8	31.4	53.6	31.2
14	54.0	30.8	53.2	31.5	52.5	31.5
15	54.7	30.8	55.2	30.7	52.8	31.1
16	53.8	30.7	54.0	31.2	51.5	30.6
17	53.5	30.8	52.8	31.4	51.9	30.3
18	52.4	30.7	53.4	31.4	50.8	31.0
19	50.6	30.6	55.8	31.2	50.0	31.0
20	50.5	30.6	53.5	30.8	48.3	30.4
21	49.2	30.7	52.8	31.1	49.8	31.0
22	51.2	30.2	54.7	31.2	51.1	31.0
23	54.4	30.7	* 55.4	* 31.1	52.2	31.4
24	54.8	30.0	56.0	31.0	51.5	31.4
25	55.6	30.7	53.8	30.6	51.2	31.4
26	53.2	30.3	55.3	31.1	51.0	31.9
27	54.6	30.6	54.5	30.7	49.4	31.4
28	55.2	30.4	55.0	31.1	50.5	31.5
29	54.8	30.6	55.8	31.0	52.0	31.1
30	55.5	30.4	55.5	31.1	52.0	31.6
31	54.5	30.6	55.5	31.4	0.0	0.0
MEANS	53.0	30.7	54.1	30.9	51.5	31.1
OBSVNS.	31	31	30	30	30	30
MAXIMUM	55.6	31.4	56.0	31.5	53.8	31.9
MINIMUM	49.2	30.0	51.8	30.3	48.3	30.3
STD.DEV.	1.71	.32	1.28	.32	1.27	.36

BONILLA ISLAND

53 29 39 N

130 38 00 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.6	31.2	47.2	30.6	45.5	31.2
2	52.0	31.5	47.5	31.0	44.0	31.0
3	51.1	31.2	47.0	31.0	43.5	31.2
4	51.5	31.4	47.9	31.0	44.2	31.5
5	49.5	31.0	46.2	30.6	44.0	31.4
6	49.8	31.2	46.2	30.6	43.5	31.5
7	50.7	30.7	47.0	30.8	42.4	31.5
8	49.2	31.1	46.2	30.8	42.7	31.6
9	49.0	31.0	47.3	31.2	42.9	31.6
10	49.5	31.0	46.8	30.8	44.2	31.2
11	48.2	31.2	46.7	31.1	43.6	31.2
12	* 48.4	* 31.1	46.8	30.8	42.7	31.2
13	48.5	31.0	46.2	31.0	* 42.8	* 31.0
14	48.8	30.8	46.8	30.8	43.0	30.8
15	48.2	31.0	46.5	30.8	* 43.5	* 30.8
16	48.0	31.2	46.8	30.8	44.0	30.8
17	48.2	31.2	45.2	31.2	44.1	31.1
18	48.0	31.2	45.8	31.0	43.8	31.4
19	48.2	31.0	45.2	30.7	44.2	30.8
20	* 48.4	* 30.8	* 45.6	* 30.4	44.3	30.8
21	48.5	30.7	46.0	30.0	44.2	31.2
22	49.0	31.0	45.9	30.6	43.0	31.2
23	48.2	31.0	45.8	30.6	43.6	31.2
24	49.0	31.2	45.5	29.9	43.6	31.4
25	48.3	31.1	45.8	30.3	44.2	31.4
26	48.0	31.2	45.8	30.4	43.5	31.4
27	47.6	31.1	44.5	30.2	43.8	31.8
28	47.8	31.1	45.5	30.6	43.2	31.4
29	46.8	30.4	45.2	30.8	* 44.2	* 31.4
30	* 47.5	* 30.6	46.2	30.8	44.4	31.5
31	48.2	30.7	0.0	0.0	44.0	31.4
MEANS	49.0	31.0	46.3	30.7	43.7	31.3
OBSVNS.	29	28	29	29	28	28
YRLY. MEANS.....					47.0	31.0
MAXIMUM	52.0	31.5	47.9	31.2	45.5	31.8
MINIMUM	46.8	30.4	44.5	29.9	42.4	30.8
STD.DEV.	1.31	.23	.79	.32	.65	.26

MC INNES ISLAND

52 15 48 N

128 43 10 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.8	30.8	40.0	31.1	39.0	30.6
2	42.8	31.0	40.0	31.0	40.8	30.8
3	41.5	30.8	40.0	31.4	40.5	31.0
4	42.0	30.4	40.2	31.1	41.3	31.0
5	42.8	30.8	41.5	31.1	41.7	31.0
6	42.9	30.7	42.0	31.2	41.5	31.0
7	42.3	30.6	42.0	31.1	41.5	30.8
8	* 42.1	* 30.7	41.9	31.0	41.7	30.8
9	* 41.9	* 30.9	* 41.8	* 31.2	42.0	30.7
10	41.7	31.1	41.8	31.4	42.0	30.7
11	41.5	30.7	41.4	31.2	42.2	31.0
12	41.2	30.7	41.3	31.2	42.1	30.8
13	40.7	30.6	41.3	31.1	42.3	30.6
14	41.1	30.4	41.2	31.1	42.4	30.7
15	42.9	30.8	41.6	31.1	42.6	30.8
16	42.2	30.7	42.2	31.1	43.0	30.7
17	42.3	31.1	42.0	30.8	43.1	30.8
18	41.8	30.8	41.0	30.8	42.8	30.7
19	39.9	30.4	43.2	31.0	42.9	30.6
20	40.3	30.6	41.5	30.7	43.0	31.0
21	41.5	30.6	41.2	30.7	42.2	30.7
22	40.8	30.7	40.5	30.3	42.1	27.4
23	39.9	30.6	40.0	30.0	41.4	29.3
24	38.2	30.6	39.9	29.9	40.8	29.0
25	38.9	30.7	38.3	29.5	41.3	27.2
26	38.0	30.7	38.3	30.0	42.0	27.1
27	39.0	30.7	38.2	30.3	42.0	28.6
28	39.0	30.8	38.7	30.3	42.6	27.7
29	39.2	30.7	39.7	30.7	42.5	28.5
30	39.4	31.0	0.0	0.0	42.8	28.6
31	40.0	31.0	0.0	0.0	43.0	28.4
MEANS	40.9	30.7	40.7	30.8	42.0	30.0
OBSVNS.	29	29	28	28	31	31
MAXIMUM	42.9	31.1	43.2	31.4	43.1	31.0
MINIMUM	38.0	30.4	38.2	29.5	39.0	27.1
STD.DEV.	1.51	.18	1.30	.49	.89	1.32

MC INNES ISLAND

52 15 48 N

128 43 10 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.7	29.7	44.5	29.5	48.5	28.4
2	43.0	29.7	45.1	28.9	49.1	28.6
3	44.3	27.6	46.5	28.1	49.1	28.5
4	42.8	29.0	47.8	28.6	49.5	29.0
5	42.5	28.9	47.0	28.2	50.0	29.9
6	43.3	30.0	46.0	27.4	50.8	29.9
7	43.4	29.5	46.5	27.7	51.0	29.4
8	43.5	29.3	47.2	27.8	51.1	29.4
9	42.2	28.9	48.5	28.0	52.7	28.6
10	43.0	28.8	47.2	27.8	52.8	28.2
11	43.1	29.7	46.5	28.6	52.0	28.6
12	43.1	28.8	45.2	29.3	51.6	28.8
13	43.3	28.8	46.5	30.2	53.0	26.5
14	43.7	29.0	47.6	28.5	52.8	26.4
15	43.7	29.1	47.7	28.9	51.8	27.8
16	43.5	29.3	48.2	28.6	53.0	27.7
17	43.6	29.0	48.3	28.5	53.2	28.1
18	43.8	29.0	47.6	28.5	52.0	28.1
19	44.3	29.5	47.7	28.5	51.7	28.1
20	43.8	29.9	49.3	28.5	49.9	28.6
21	43.5	29.7	45.8	29.3	50.0	28.6
22	43.3	29.5	45.9	28.9	50.8	28.8
23	43.3	29.3	46.2	28.9	51.5	29.3
24	43.9	29.0	47.0	28.8	50.8	29.4
25	44.1	29.1	46.8	28.6	51.1	29.1
26	44.3	29.8	47.0	28.8	50.3	28.9
27	44.1	29.9	48.0	29.0	50.0	29.8
28	44.3	29.8	50.5	28.1	49.8	29.9
29	44.8	29.4	50.1	26.7	50.2	28.9
30	44.2	29.3	49.6	27.4	52.5	29.7
31	0.0	0.0	49.4	28.2	0.0	0.0

MEANS	43.6	29.3	47.3	28.5	51.1	28.7
OBSVNS.	30	30	31	31	30	30
MAXIMUM	44.8	30.0	50.5	30.2	53.2	29.9
MINIMUM	42.2	27.6	44.5	26.7	48.5	26.4
STD.DEV.	.61	.49	1.46	.69	1.32	.87

MC INNES ISLAND

52 15 48 N

128 43 10 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	53.2	28.9	57.5	29.0	54.3	29.5
2	55.2	29.8	57.0	29.3	54.2	29.5
3	56.8	27.4	56.5	29.5	55.1	29.1
4	57.7	27.7	54.5	29.5	53.3	29.3
5	52.8	28.2	57.2	29.5	52.4	29.8
6	51.8	28.5	57.9	29.1	53.2	30.2
7	51.9	28.6	58.6	29.0	52.9	30.2
8	52.5	28.4	56.8	29.7	52.8	30.2
9	54.3	28.5	55.5	29.0	53.6	30.0
10	54.7	28.0	55.4	29.4	53.7	29.5
11	56.0	27.1	55.7	29.5	53.5	29.8
12	54.0	28.6	53.2	29.5	53.9	30.2
13	51.5	29.0	52.6	29.5	53.6	29.5
14	55.2	29.0	54.9	29.3	53.3	30.3
15	56.2	28.8	54.3	29.8	52.8	30.2
16	55.6	29.4	53.6	29.5	52.8	30.2
17	53.5	29.7	54.5	29.9	52.9	30.0
18	54.7	29.1	56.2	29.5	50.3	30.4
19	56.2	28.0	57.5	29.8	51.5	30.8
20	55.8	28.5	56.3	29.7	51.1	30.6
21	54.2	28.5	57.2	29.4	50.0	30.4
22	53.9	28.5	58.6	28.9	50.3	30.3
23	54.2	28.4	56.8	29.8	51.8	31.2
24	54.7	28.1	57.9	30.0	50.5	30.7
25	55.7	28.2	57.8	30.2	50.7	28.1
26	55.0	28.6	57.8	30.2	49.5	28.8
27	55.8	29.4	59.1	29.3	48.7	29.5
28	54.8	29.3	58.3	29.8	49.4	29.7
29	57.2	29.0	57.0	29.8	49.2	30.3
30	58.0	29.1	57.2	29.7	47.4	31.1
31	57.5	29.0	56.3	29.8	0.0	0.0
MEANS	54.9	28.6	56.4	29.5	52.0	30.0
OBSVNS.	31	31	31	31	30	30
MAXIMUM	58.0	29.8	59.1	30.2	55.1	31.2
MINIMUM	51.5	27.1	52.6	28.9	47.4	28.1
STD.DEV.	1.72	.62	1.66	.34	1.95	.66

MC INNES ISLAND

52 15 48 N

128 43 10 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	47.8	30.8	46.8	31.0	45.0	30.6
2	48.9	30.8	46.8	31.0	44.0	30.3
3	48.6	30.8	46.7	30.0	43.0	29.8
4	48.6	30.0	46.6	30.8	42.8	29.7
5	49.2	28.8	46.2	28.8	42.8	29.7
6	49.3	30.6	46.1	28.2	42.2	29.9
7	49.3	30.3	46.2	27.6	43.7	29.8
8	49.1	29.9	45.6	28.5	42.4	30.3
9	49.0	29.9	46.2	29.0	42.8	30.4
10	47.2	29.8	46.0	29.0	42.2	30.4
11	48.1	29.3	45.8	28.8	43.2	30.4
12	48.1	29.1	45.7	28.5	43.0	30.6
13	48.5	28.6	45.2	28.8	43.2	30.7
14	48.0	28.8	45.1	27.8	43.0	31.0
15	48.2	29.5	44.4	27.8	44.3	30.7
16	47.7	29.1	43.7	28.5	45.1	31.2
17	46.8	29.3	43.2	28.8	44.5	31.0
18	47.0	29.0	44.0	29.5	43.5	30.8
19	47.2	29.7	44.2	29.7	43.9	30.6
20	47.8	28.6	44.7	29.8	43.9	30.6
21	47.7	30.4	46.5	30.4	43.3	30.3
22	48.0	30.6	47.1	31.1	42.3	30.0
23	47.1	29.7	46.5	30.8	43.6	30.3
24	47.6	30.7	45.5	30.7	44.4	31.0
25	46.8	30.3	46.8	31.5	44.4	31.5
26	46.6	30.0	46.4	31.0	44.9	31.4
27	47.2	30.2	45.4	30.6	43.7	30.8
28	47.0	28.9	46.0	30.6	43.3	30.7
29	46.2	29.0	46.0	30.6	42.9	30.4
30	45.4	30.0	46.2	30.7	44.4	31.1
31	47.2	30.7	0.0	0.0	43.8	30.8
MEANS	47.8	29.8	45.7	29.7	43.5	30.5
OBSVNS.	31	31	30	30	31	31
YRLY. MEANS.....					47.2	29.7
MAXIMUM	49.3	30.8	47.1	31.5	45.1	31.5
MINIMUM	45.4	28.6	43.2	27.6	42.2	29.7
STD.DEV.	.97	.72	1.01	1.18	.83	.48

CAPE ST JAMES

51 56 18 N

131 00 50W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.9	* 0.0	40.7	* 0.0	* 41.4	* 0.0
2	* 42.8	* 0.0	40.7	* 0.0	41.3	* 0.0
3	* 42.7	* 0.0	40.9	* 0.0	41.4	* 0.0
4	42.7	* 0.0	41.3	* 0.0	41.3	* 0.0
5	42.8	* 0.0	41.4	* 0.0	41.1	* 0.0
6	42.6	* 0.0	41.3	* 0.0	41.1	* 0.0
7	42.5	* 0.0	* 41.2	* 0.0	41.2	* 0.0
8	* 0.0	* 0.0	41.1	* 0.0	41.9	* 0.0
9	* 0.0	* 0.0	* 41.2	* 0.0	42.4	* 0.0
10	* 0.0	* 0.0	41.4	* 0.0	42.2	* 0.0
11	41.6	* 0.0	* 41.3	* 0.0	42.4	* 0.0
12	41.5	* 0.0	41.2	* 0.0	42.7	* 0.0
13	40.8	* 0.0	41.3	* 0.0	42.7	* 0.0
14	42.0	* 0.0	41.3	* 0.0	43.2	* 0.0
15	42.7	* 0.0	41.7	* 0.0	43.7	* 0.0
16	42.2	* 0.0	41.7	* 0.0	43.8	* 0.0
17	42.1	* 0.0	41.6	* 0.0	43.2	* 0.0
18	41.6	* 0.0	40.6	* 0.0	42.9	* 0.0
19	41.3	* 0.0	* 41.2	* 0.0	43.0	* 0.0
20	41.4	* 0.0	41.7	* 0.0	43.0	* 0.0
21	41.4	* 0.0	* 41.6	* 0.0	43.0	* 0.0
22	40.7	* 0.0	41.6	* 0.0	* 42.7	* 0.0
23	40.3	* 0.0	41.5	* 0.0	* 42.3	* 0.0
24	* 40.0	* 0.0	* 41.5	* 0.0	42.0	* 0.0
25	39.6	* 0.0	41.5	* 0.0	42.4	* 0.0
26	39.1	* 0.0	40.9	* 0.0	* 43.3	* 0.0
27	40.1	* 0.0	41.5	* 0.0	44.2	* 0.0
28	* 40.3	* 0.0	* 41.4	* 0.0	* 43.6	* 0.0
29	40.5	* 0.0	41.4	* 0.0	43.1	* 0.0
30	40.5	* 0.0	0.0	0.0	43.3	* 0.0
31	40.5	* 0.0	0.0	0.0	* 43.7	* 0.0
MEANS	41.4	0.0	41.3	0.0	42.5	0.0
OBSVNS.	24	0	22	0	25	0
MAXIMUM	42.9	0.0	41.7	0.0	44.2	0.0
MINIMUM	39.1	0.0	40.6	0.0	41.1	0.0
STD.DEV.	1.07	0.00	.34	0.00	.90	0.00

CAPE ST JAMES

51 56 18 N

131 00 50W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 44.1	* 0.0	42.5	* 0.0	* 47.7	* 0.0
2	44.5	* 0.0	44.6	* 0.0	46.8	* 0.0
3	44.1	* 0.0	45.1	* 0.0	46.8	* 0.0
4	43.8	* 0.0	45.1	* 0.0	46.8	* 0.0
5	43.2	* 0.0	45.6	* 0.0	46.3	* 0.0
6	43.7	* 0.0	* 44.3	* 0.0	47.4	* 0.0
7	* 43.6	* 0.0	47.0	* 0.0	48.5	* 0.0
8	43.5	* 0.0	47.9	* 0.0	49.4	* 0.0
9	43.7	* 0.0	45.5	* 0.0	* 49.1	* 0.0
10	45.6	* 0.0	46.4	* 0.0	48.8	* 0.0
11	* 45.2	* 0.0	* 45.8	* 0.0	49.6	* 0.0
12	44.9	* 0.0	45.2	* 0.0	* 49.6	* 0.0
13	44.0	* 0.0	* 45.8	* 0.0	49.5	* 0.0
14	43.9	* 0.0	46.3	* 0.0	49.3	* 0.0
15	44.7	* 0.0	46.3	* 0.0	48.7	* 0.0
16	* 44.5	* 0.0	45.8	* 0.0	* 48.9	* 0.0
17	44.3	* 0.0	46.5	* 0.0	49.1	* 0.0
18	44.3	* 0.0	46.6	* 0.0	48.5	* 0.0
19	* 44.1	* 0.0	46.5	* 0.0	48.1	* 0.0
20	* 43.8	* 0.0	* 46.6	* 0.0	48.1	* 0.0
21	43.5	* 0.0	46.6	* 0.0	49.2	* 0.0
22	45.1	* 0.0	* 46.8	* 0.0	48.7	* 0.0
23	* 44.9	* 0.0	47.0	* 0.0	* 49.9	* 0.0
24	44.4	* 0.0	48.3	* 0.0	* 51.2	* 0.0
25	43.5	* 0.0	48.4	* 0.0	52.4	* 0.0
26	* 44.0	* 0.0	48.6	* 0.0	* 52.3	* 0.0
27	44.6	* 0.0	49.2	* 0.0	* 52.2	* 0.0
28	* 44.4	* 0.0	49.6	* 0.0	52.1	* 0.0
29	44.3	* 0.0	* 49.6	* 0.0	52.0	* 0.0
30	44.1	* 0.0	49.5	* 0.0	50.3	* 0.0
31	0.0	0.0	* 48.6	* 0.0	0.0	0.0
MEANS	44.2	0.0	46.7	0.0	48.9	0.0
OBSVNS.	21	0	24	0	22	0
MAXIMUM	45.6	0.0	49.6	0.0	52.4	0.0
MINIMUM	43.2	0.0	42.5	0.0	46.3	0.0
STD.DEV.	.60	0.00	1.70	0.00	1.68	0.00

CAPE ST JAMES

51 56 18 N

131 00 50W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.8	* 0.0	54.3	* 0.0	59.2	* 0.0
2	53.8	* 0.0	53.0	* 0.0	55.6	* 0.0
3	53.0	* 0.0	52.9	* 0.0	56.1	* 0.0
4	50.7	* 0.0	53.5	* 0.0	54.7	* 0.0
5	50.6	* 0.0	52.9	* 0.0	54.5	* 0.0
6	51.4	* 0.0	53.8	* 0.0	54.5	* 0.0
7	53.6	* 0.0	* 54.2	* 0.0	55.0	* 0.0
8	55.1	* 0.0	54.6	* 0.0	55.2	* 0.0
9	* 54.2	* 0.0	54.9	* 0.0	55.8	* 0.0
10	53.4	* 0.0	54.1	* 0.0	56.1	* 0.0
11	51.7	* 0.0	54.8	* 0.0	56.0	* 0.0
12	50.9	* 0.0	56.3	* 0.0	57.3	* 0.0
13	50.7	* 0.0	55.3	* 0.0	56.3	* 0.0
14	51.6	* 0.0	55.2	* 0.0	* 56.0	* 0.0
15	53.1	* 0.0	56.3	* 0.0	* 55.8	* 0.0
16	51.6	* 0.0	57.3	* 0.0	55.6	* 0.0
17	51.5	* 0.0	56.2	* 0.0	* 55.2	* 0.0
18	54.7	* 0.0	56.4	* 0.0	54.7	* 0.0
19	54.4	* 0.0	56.6	* 0.0	54.0	* 0.0
20	54.3	* 0.0	57.2	* 0.0	53.7	* 0.0
21	54.7	* 0.0	58.8	* 0.0	53.0	* 0.0
22	55.5	* 0.0	58.0	* 0.0	53.0	* 0.0
23	54.9	* 0.0	54.7	* 0.0	53.5	* 0.0
24	55.1	* 0.0	53.5	* 0.0	53.5	* 0.0
25	54.3	* 0.0	55.2	* 0.0	51.7	* 0.0
26	53.7	* 0.0	55.4	* 0.0	53.1	* 0.0
27	53.6	* 0.0	56.1	* 0.0	51.9	* 0.0
28	53.4	* 0.0	54.3	* 0.0	* 51.7	* 0.0
29	54.4	* 0.0	55.5	* 0.0	* 51.5	* 0.0
30	53.1	* 0.0	54.4	* 0.0	51.3	* 0.0
31	52.8	* 0.0	57.9	* 0.0	0.0	0.0
MEANS	53.1	0.0	55.3	0.0	54.6	0.0
OBSVNS.	30	0	30	0	25	0
MAXIMUM	55.5	0.0	58.8	0.0	59.2	0.0
MINIMUM	50.6	0.0	52.9	0.0	51.3	0.0
STD.DEV.	1.49	0.00	1.57	0.00	1.82	0.00

CAPE ST JAMES

51 56 18 N

131 00 50W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.3	* 0.0	47.5	* 0.0	47.2	* 0.0
2	* 50.3	* 0.0	47.7	* 0.0	46.0	* 0.0
3	49.3	* 0.0	47.7	* 0.0	45.5	* 0.0
4	50.1	* 0.0	47.5	* 0.0	45.0	* 0.0
5	* 50.0	* 0.0	46.6	* 0.0	45.1	* 0.0
6	49.9	* 0.0	46.5	* 0.0	45.3	* 0.0
7	50.0	* 0.0	* 46.5	* 0.0	45.0	* 0.0
8	* 49.6	* 0.0	* 46.5	* 0.0	45.4	* 0.0
9	49.1	* 0.0	46.5	* 0.0	45.7	* 0.0
10	48.0	* 0.0	* 46.4	* 0.0	46.0	* 0.0
11	* 48.8	* 0.0	46.2	* 0.0	46.2	* 0.0
12	49.7	* 0.0	46.3	* 0.0	46.0	* 0.0
13	49.9	* 0.0	46.5	* 0.0	45.8	* 0.0
14	50.7	* 0.0	46.8	* 0.0	45.7	* 0.0
15	51.5	* 0.0	46.8	* 0.0	45.8	* 0.0
16	50.7	* 0.0	46.8	* 0.0	46.0	* 0.0
17	49.9	* 0.0	46.0	* 0.0	46.2	* 0.0
18	50.0	* 0.0	45.7	* 0.0	46.0	* 0.0
19	50.2	* 0.0	46.2	* 0.0	46.1	* 0.0
20	50.5	* 0.0	46.6	* 0.0	45.8	* 0.0
21	50.0	* 0.0	46.7	* 0.0	45.3	* 0.0
22	49.2	* 0.0	45.5	* 0.0	44.8	* 0.0
23	49.0	* 0.0	* 45.7	* 0.0	45.4	* 0.0
24	* 48.7	* 0.0	* 46.0	* 0.0	45.5	* 0.0
25	* 48.3	* 0.0	46.2	* 0.0	* 45.4	* 0.0
26	48.0	* 0.0	* 46.3	* 0.0	45.3	* 0.0
27	47.9	* 0.0	46.4	* 0.0	45.1	* 0.0
28	48.1	* 0.0	47.2	* 0.0	45.1	* 0.0
29	* 0.0	* 0.0	47.3	* 0.0	45.1	* 0.0
30	* 0.0	* 0.0	47.1	* 0.0	45.0	* 0.0
31	* 0.0	* 0.0	0.0	0.0	45.1	* 0.0
MEANS	49.7	0.0	46.7	0.0	45.6	0.0
OBSVNS.	22	0	24	0	30	0
YRLY. MEANS.....					47.8	0.0
MAXIMUM	51.5	0.0	47.7	0.0	47.2	0.0
MINIMUM	47.9	0.0	45.5	0.0	44.8	0.0
STD.DEV.	1.03	0.00	.59	0.00	.52	0.00

EGG ISLAND

51 15 06 N

127 49 53 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.2	31.5	40.5	32.3	40.4	32.3
2	42.2	31.8	40.9	32.3	41.8	31.9
3	41.9	31.4	41.8	32.3	42.3	31.9
4	42.4	31.5	42.1	32.1	41.8	31.8
5	42.5	31.5	42.1	32.1	42.1	31.9
6	42.6	31.5	42.2	32.1	42.4	31.6
7	43.1	31.5	42.2	32.1	41.9	32.0
8	* 42.7	* 31.5	42.1	31.9	42.3	31.4
9	42.3	31.5	42.3	32.0	43.1	31.9
10	41.6	31.8	42.3	32.1	42.5	31.6
11	41.2	32.0	42.5	32.1	45.0	31.4
12	40.8	31.9	42.5	32.1	43.1	31.5
13	41.0	31.6	42.0	32.4	43.8	31.0
14	41.2	31.6	42.7	31.5	44.0	31.1
15	42.2	31.8	42.4	32.1	43.5	31.0
16	42.5	31.5	42.2	32.1	44.5	31.0
17	42.3	31.8	42.8	31.9	* 45.4	* 31.0
18	41.5	31.6	43.1	31.6	46.2	31.0
19	41.4	32.1	42.6	31.6	45.3	31.5
20	41.4	31.9	42.6	31.9	45.1	30.7
21	41.6	31.8	42.4	31.9	44.6	31.2
22	41.5	31.9	41.6	31.9	44.5	31.2
23	41.2	32.1	41.5	31.8	* 43.5	* 30.9
24	41.4	32.1	41.7	32.1	42.5	30.6
25	40.6	32.0	41.8	32.4	43.1	30.3
26	40.5	31.8	41.5	32.4	44.2	29.7
27	40.4	31.8	* 40.7	* 32.3	44.7	29.9
28	41.4	31.9	* 39.9	* 32.2	45.2	30.2
29	42.2	31.9	39.2	32.1	45.6	30.3
30	41.7	31.9	0.0	0.0	46.0	30.2
31	40.8	32.1	0.0	0.0	45.5	30.0

MEANS	41.7	31.8	42.0	32.0	43.7	31.1
OBSVNS.	30	30	27	27	29	29

MAXIMUM	43.2	32.1	43.1	32.4	46.2	32.3
MINIMUM	40.4	31.4	39.2	31.5	40.4	29.7

STD.DEV.	.74	.22	.79	.24	1.51	.71
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EGG ISLAND

51 15 06 N

127 49 53 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.6	30.4	44.9	31.2	53.2	26.4
2	45.0	30.2	46.5	30.6	54.2	26.1
3	45.5	30.2	46.7	30.2	54.8	28.8
4	44.9	30.6	48.2	30.6	51.9	29.3
5	44.2	30.4	49.1	30.7	49.9	31.2
6	43.5	30.6	47.7	30.7	51.7	28.9
7	43.2	30.6	47.4	30.3	51.9	28.2
8	43.0	30.8	48.5	30.4	52.9	27.8
9	43.5	30.4	49.1	29.8	52.7	27.4
10	44.4	30.7	48.4	30.4	51.5	24.3
11	44.6	30.4	48.0	31.2	51.0	26.3
12	45.8	30.3	47.3	30.7	52.1	26.7
13	45.5	30.6	46.5	30.8	52.4	26.7
14	45.2	30.7	47.7	31.0	52.1	26.9
15	45.5	30.6	49.2	31.2	51.0	28.8
16	44.5	30.4	49.4	29.1	* 51.1	* 30.2
17	44.9	30.4	47.9	30.0	51.2	31.5
18	46.6	30.6	47.5	31.0	52.3	28.4
19	46.2	30.2	50.5	29.0	50.1	29.1
20	45.6	30.2	50.7	28.2	50.3	29.7
21	43.5	30.0	* 48.1	* 29.6	* 51.0	* 29.5
22	44.0	30.2	45.5	31.0	51.7	29.3
23	44.7	30.7	46.9	30.2	51.8	29.8
24	45.5	30.4	* 49.1	* 29.4	52.4	30.0
25	45.4	30.2	51.3	28.5	52.2	30.3
26	44.9	31.2	50.4	28.9	52.5	30.4
27	* 44.8	* 31.0	51.3	28.8	51.4	31.1
28	44.8	30.7	54.7	26.0	49.7	31.8
29	45.4	30.7	51.7	25.6	51.2	31.6
30	44.9	31.0	* 51.7	* 25.5	51.6	31.4
31	0.0	0.0	51.7	25.4	0.0	0.0
MEANS	44.8	30.5	48.7	29.7	51.8	28.9
OBSVNS.	29	29	28	28	28	28
MAXIMUM	46.6	31.2	54.7	31.2	54.8	31.8
MINIMUM	43.0	30.0	44.9	25.4	49.7	24.3
STD.DEV.	.89	.27	2.18	1.66	1.15	1.98

EGG ISLAND

51 15 06 N

127 49 53 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.4	30.3	56.6	29.9	52.1	31.1
2	57.3	25.9	57.7	29.3	52.5	31.0
3	59.6	25.0	58.4	28.6	52.1	31.5
4	58.7	27.7	57.5	28.0	56.4	31.1
5	54.7	27.6	56.5	27.8	52.5	31.4
6	51.7	30.3	57.7	29.5	53.0	31.2
7	54.3	27.3	58.0	29.5	54.0	30.7
8	55.3	24.2	56.6	29.1	54.2	31.0
9	53.9	28.4	55.7	30.2	53.5	31.5
10	53.6	30.0	56.7	28.2	53.5	31.2
11	50.3	29.8	58.4	28.9	* 53.5	* 31.3
12	49.9	31.5	57.8	29.4	* 53.6	* 31.4
13	49.6	31.2	57.1	29.8	53.6	31.5
14	51.3	30.8	55.5	29.9	52.2	32.0
15	51.3	31.1	55.4	30.0	51.3	31.8
16	52.2	30.7	54.3	30.4	50.8	30.4
17	52.7	30.6	56.1	28.6	51.1	31.0
18	55.8	30.8	55.7	28.4	49.4	32.7
19	59.1	29.8	55.7	28.6	49.1	32.8
20	56.7	30.4	57.9	28.2	48.5	31.6
21	57.2	30.4	57.8	29.0	48.1	31.9
22	56.3	30.0	57.5	30.4	48.4	32.4
23	56.5	31.1	54.6	30.4	48.6	31.8
24	55.1	30.0	54.5	30.2	48.4	32.1
25	56.2	30.7	52.4	31.1	49.2	31.8
26	55.7	29.9	* 52.4	* 31.4	48.5	31.9
27	53.4	29.8	52.3	31.6	48.4	32.8
28	54.8	30.8	54.8	30.8	49.3	* 32.6
29	54.4	30.4	53.9	30.7	48.8	32.5
30	54.9	29.8	53.6	31.0	48.4	31.9
31	54.9	29.9	54.2	30.7	0.0	0.0
MEANS	54.5	29.6	56.0	29.6	50.9	31.7
OBSVNS.	31	31	30	30	28	27
MAXIMUM	59.6	31.5	58.4	31.6	56.4	32.8
MINIMUM	49.6	24.2	52.3	27.8	48.1	30.4
STD.DEV.	2.65	1.83	1.74	1.03	2.36	.64

EGG ISLAND

51 15 06 N

127 49 53 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	48.0	32.1	46.5	32.0	43.9	31.0
2	47.7	32.0	46.6	32.0	43.3	31.2
3	47.7	32.4	46.9	32.1	41.8	31.1
4	47.5	31.9	47.2	31.9	43.1	31.8
5	48.0	31.9	46.5	32.0	42.5	32.0
6	48.7	32.5	47.3	32.4	42.5	32.0
7	49.6	* 32.3	46.6	32.3	42.6	32.0
8	* 48.9	* 32.1	45.3	32.5	43.1	32.3
9	48.2	31.9	46.0	32.0	42.7	32.3
10	46.9	32.5	50.0	31.9	44.3	32.1
11	47.2	32.7	46.7	31.9	43.5	32.1
12	* 47.8	* 32.5	45.9	31.8	43.5	32.4
13	48.5	32.3	45.4	31.4	43.3	32.0
14	48.2	31.8	44.8	31.0	43.5	32.1
15	48.5	31.9	44.4	31.8	43.5	31.8
16	46.5	31.8	44.4	31.9	44.6	31.9
17	47.1	31.6	42.7	31.5	44.8	31.9
18	47.3	31.6	44.0	31.6	44.7	31.9
19	47.6	31.9	45.2	31.5	45.1	32.1
20	48.1	31.6	46.7	31.8	45.5	32.0
21	47.6	31.9	46.8	31.9	45.2	32.1
22	48.2	32.1	46.5	31.6	44.4	32.1
23	47.4	32.4	46.5	31.9	44.8	32.4
24	47.3	32.7	45.0	31.9	45.0	32.1
25	47.2	32.7	45.5	31.5	44.9	32.1
26	47.3	32.7	45.4	31.6	44.5	32.4
27	46.3	32.0	43.4	31.6	44.7	32.1
28	* 46.7	* 32.4	45.3	31.5	43.8	32.1
29	47.1	32.9	45.7	31.8	43.4	32.0
30	45.6	33.0	45.6	31.6	43.5	31.6
31	46.1	32.5	0.0	0.0	43.7	31.9

MEANS	47.5	32.2	45.8	31.8	43.9	32.0
OBSVNS.	28	27	30	30	31	31
YRLY. MEANS					47.6	30.9
MAXIMUM	49.6	33.0	50.0	32.5	45.5	32.4
MINIMUM	45.6	31.6	42.7	31.0	41.8	31.0
STD.DEV.	.84	.42	1.37	.31	.94	.34

PINE ISLAND

50 58 33 N

127 43 35 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.8	31.6	42.0	31.4	* 41.8	* 31.5
2	43.7	31.6	42.2	31.4	* 42.1	* 31.3
3	43.2	32.0	41.8	31.2	42.4	31.2
4	43.4	31.8	42.0	31.4	42.2	31.2
5	43.6	31.6	42.0	31.2	42.2	31.5
6	43.6	31.6	41.8	31.2	42.4	31.5
7	43.5	31.5	41.8	31.4	42.0	31.8
8	* 43.3	* 31.4	* 41.9	* 31.4	42.2	31.5
9	* 43.0	* 31.3	* 41.9	* 31.4	41.6	31.5
10	42.8	31.2	42.0	31.4	42.4	31.2
11	43.0	31.2	42.4	32.1	43.3	30.6
12	42.8	31.4	42.8	31.8	43.2	30.4
13	42.6	31.2	41.8	32.1	43.2	31.2
14	42.6	31.1	41.6	32.3	43.4	31.1
15	42.4	31.2	43.0	32.1	44.0	30.6
16	43.0	31.4	* 42.9	* 31.9	44.0	30.6
17	42.6	31.2	* 42.8	* 31.6	44.2	30.7
18	42.6	31.2	42.8	31.4	43.8	30.7
19	43.0	32.1	42.8	31.4	44.2	30.3
20	42.8	31.6	42.6	31.2	* 44.2	* 30.2
21	43.2	31.9	42.4	31.6	* 44.2	* 30.0
22	* 43.1	* 31.7	42.8	31.8	44.2	29.9
23	* 43.0	* 31.4	42.6	31.6	44.0	30.2
24	43.0	31.2	42.6	31.8	43.5	30.0
25	42.8	31.2	42.6	31.8	43.6	30.2
26	42.6	31.2	42.6	31.6	43.6	30.4
27	42.0	31.5	* 42.2	* 31.6	43.8	30.4
28	42.2	31.6	41.8	31.6	44.2	30.8
29	42.2	31.6	41.6	31.6	44.0	30.8
30	42.0	31.5	0.0	0.0	43.8	31.4
31	42.4	31.4	0.0	0.0	43.8	31.4
MEANS	42.9	31.5	42.3	31.6	43.3	30.9
OBSVNS.	27	27	24	24	27	27
MAXIMUM	43.8	32.1	43.0	32.3	44.2	31.8
MINIMUM	42.0	31.1	41.6	31.2	41.6	29.9
STD.DEV.	.51	.27	.44	.32	.81	.53

PINE ISLAND

50 58 33 N

127 43 35 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 43.8	* 31.5	44.6	31.2	47.8	31.8
2	44.6	31.6	44.9	31.2	48.0	31.9
3	43.8	30.6	44.8	31.4	47.9	31.5
4	44.4	30.6	45.2	31.2	* 47.4	* 31.6
5	44.4	30.7	45.0	31.2	47.0	31.6
6	43.6	30.7	46.0	31.5	47.5	31.6
7	44.0	30.6	* 0.0	* 0.0	47.2	31.2
8	43.4	30.4	* 0.0	* 0.0	47.8	31.5
9	43.2	30.4	* 0.0	* 0.0	* 47.4	* 31.6
10	* 0.0	* 0.0	* 0.0	* 0.0	* 47.0	* 31.7
11	* 0.0	* 0.0	45.7	31.6	46.6	31.8
12	* 0.0	* 0.0	45.6	31.5	46.9	31.8
13	43.4	30.7	45.8	31.8	47.4	31.4
14	43.6	30.7	46.8	31.8	47.8	31.4
15	44.2	31.0	46.2	31.8	47.6	31.2
16	43.9	31.1	46.2	31.8	* 47.5	* 31.3
17	44.2	31.0	46.2	31.6	* 47.3	* 31.4
18	43.8	30.8	46.4	31.8	47.2	31.5
19	43.7	30.8	46.8	31.8	47.8	31.5
20	43.8	31.1	47.2	31.8	47.6	31.2
21	* 0.0	* 0.0	* 47.3	* 31.8	47.8	31.4
22	* 0.0	* 0.0	47.4	31.8	48.2	31.5
23	* 0.0	* 0.0	46.3	31.6	48.5	31.6
24	* 0.0	* 0.0	46.8	31.9	* 48.2	* 31.4
25	44.2	31.0	47.4	31.8	47.8	31.2
26	44.4	31.1	* 47.4	* 31.8	48.4	31.5
27	44.2	31.1	47.4	31.8	48.2	31.5
28	44.4	30.8	47.2	31.9	* 48.4	* 31.4
29	44.6	30.8	46.5	31.4	48.6	31.4
30	44.2	30.4	46.8	31.5	48.4	31.4
31	0.0	0.0	47.4	31.8	0.0	0.0
MEANS	44.0	30.8	46.3	31.6	47.7	31.5
OBSVNS.	22	22	25	25	23	23
MAXIMUM	44.6	31.6	47.4	31.9	48.6	31.9
MINIMUM	43.2	30.4	44.6	31.2	46.6	31.2
STD.DEV.	.41	.29	.88	.24	.53	.20

PINE ISLAND

50 58 33 N

127 43 35 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 48.8	* 31.4	49.6	31.5	49.0	31.6
2	49.2	31.4	49.4	31.8	49.5	31.9
3	49.4	31.2	52.1	31.9	49.4	31.9
4	50.0	31.4	49.8	31.2	49.2	31.6
5	50.2	31.4	49.8	31.2	48.8	31.6
6	50.2	31.2	51.2	31.6	49.2	31.6
7	51.3	31.4	48.8	31.5	48.5	31.5
8	49.2	31.0	48.8	31.5	48.5	31.6
9	* 48.8	* 31.1	48.6	31.4	48.2	31.8
10	* 48.4	* 31.3	50.6	31.5	47.8	31.9
11	48.0	31.4	51.2	31.1	47.8	31.9
12	48.0	31.5	51.2	31.5	48.5	31.9
13	48.6	30.7	51.4	31.5	48.6	31.9
14	48.6	31.2	48.6	31.5	48.8	31.8
15	49.0	31.2	49.5	31.6	48.6	31.9
16	* 48.9	* 31.2	* 0.0	* 0.0	48.8	31.9
17	48.8	31.2	* 0.0	* 0.0	48.8	31.9
18	* 49.5	* 31.3	* 0.0	* 0.0	47.8	31.6
19	50.2	31.4	50.9	31.4	47.8	31.6
20	48.6	30.7	50.9	31.4	* 47.7	* 31.6
21	50.4	31.5	51.0	31.4	* 47.5	* 31.6
22	50.8	31.1	51.4	30.4	47.4	31.6
23	* 51.4	* 30.8	49.4	31.5	47.2	31.8
24	52.0	30.4	48.8	31.4	48.0	32.0
25	* 52.2	* 30.7	48.9	31.6	47.2	31.9
26	52.4	31.0	48.6	31.8	47.5	31.9
27	49.4	31.1	48.6	31.8	47.0	32.3
28	48.0	31.2	48.5	31.6	46.8	32.3
29	47.8	31.5	48.8	31.5	47.4	32.3
30	49.4	31.6	50.2	31.6	47.2	32.3
31	45.8	31.6	* 49.6	* 31.6	0.0	0.0
MEANS	49.4	31.2	49.9	31.5	48.2	31.8
OBSVNS.	24	24	27	27	28	28
MAXIMUM	52.4	31.6	52.1	31.9	49.5	32.3
MINIMUM	45.8	30.4	48.5	30.4	46.8	31.5
STD.DEV.	1.45	.30	1.14	.28	.79	.23

PINE ISLAND

50 58 33 N

127 43 35 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 47.2	* 32.2	* 46.6	* 31.8	46.5	31.5
2	* 47.1	* 32.0	46.6	31.8	* 46.3	* 31.5
3	47.0	31.9	46.6	31.8	* 46.0	* 31.5
4	47.0	31.9	46.4	31.8	45.8	31.5
5	47.2	32.0	* 46.4	* 31.7	45.6	31.4
6	47.0	31.8	46.4	31.6	45.6	31.4
7	47.0	31.9	47.0	32.3	45.4	31.6
8	47.2	31.8	47.2	32.0	45.6	31.8
9	47.0	31.8	47.6	31.8	45.2	31.4
10	46.8	31.8	47.6	31.8	* 0.0	* 0.0
11	47.0	31.9	47.6	32.0	* 0.0	* 0.0
12	47.2	31.8	47.6	32.0	* 0.0	* 0.0
13	47.0	31.8	47.8	32.0	* 0.0	* 0.0
14	47.4	31.8	46.8	32.0	* 0.0	* 0.0
15	47.2	31.8	46.6	31.8	* 0.0	* 0.0
16	47.0	31.8	* 46.6	* 31.8	* 0.0	* 0.0
17	47.4	31.8	46.6	31.9	44.9	31.6
18	46.7	31.6	* 46.6	* 31.9	44.9	31.8
19	* 46.8	* 31.6	* 46.7	* 31.8	45.1	31.8
20	46.8	31.6	46.8	31.8	45.2	31.6
21	46.6	31.6	46.7	31.9	45.1	31.6
22	46.0	31.9	46.7	31.8	45.2	31.6
23	47.0	32.3	46.2	31.5	* 0.0	* 0.0
24	47.6	31.9	46.0	31.8	* 0.0	* 0.0
25	47.4	31.9	46.0	31.8	* 0.0	* 0.0
26	47.0	32.3	46.0	31.6	* 0.0	* 0.0
27	46.7	31.8	45.0	31.4	* 0.0	* 0.0
28	46.7	31.6	45.8	31.5	45.3	31.9
29	46.7	31.8	45.8	31.5	45.0	32.0
30	46.6	31.8	45.5	31.6	45.1	31.6
31	* 46.6	* 31.8	0.0	0.0	45.1	31.6

MEANS	47.0	31.8	46.6	31.8	45.3	31.6
OBSVNS.	27	27	25	25	17	17
YRLY. MEANS.....					46.1	31.5
MAXIMUM	47.6	32.3	47.8	32.3	46.5	32.0
MINIMUM	46.0	31.6	45.0	31.4	44.9	31.4
STD.DEV.	.32	.17	.72	.21	.40	.18

KAINS ISLAND

50 26 39 N

128 01 47 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.6	30.4	41.8	31.2	42.2	29.7
2	43.1	30.0	41.4	31.2	42.8	30.7
3	43.5	30.2	41.3	31.1	42.8	29.9
4	43.6	29.1	42.3	31.1	42.0	29.8
5	44.7	30.8	42.7	31.4	42.6	29.9
6	44.4	29.7	43.2	31.4	42.3	29.8
7	43.0	29.0	43.2	31.5	42.4	29.8
8	44.6	30.6	42.8	28.4	42.6	29.4
9	43.2	30.8	43.1	28.5	42.9	29.8
10	43.0	30.3	42.4	29.3	43.5	29.0
11	43.1	30.4	42.8	30.8	43.8	28.5
12	42.0	29.7	43.2	30.8	44.0	28.8
13	42.2	29.8	42.6	29.8	44.6	28.8
14	42.8	30.0	42.7	29.8	44.5	29.1
15	43.7	31.2	42.9	30.2	44.8	28.4
16	43.4	31.4	42.4	29.8	45.2	28.5
17	42.3	30.2	43.1	29.1	45.3	28.1
18	42.2	29.7	43.4	29.5	45.3	27.2
19	42.0	29.5	43.1	30.4	45.0	27.3
20	42.8	29.8	43.0	29.1	45.2	27.2
21	43.3	30.7	42.4	28.6	43.8	26.0
22	42.5	30.2	41.8	28.5	44.6	26.9
23	41.2	29.9	42.5	28.2	43.2	27.1
24	40.4	30.3	42.7	28.5	43.3	26.1
25	40.1	30.6	42.4	30.2	43.0	24.3
26	39.0	31.0	42.2	29.9	44.2	25.0
27	40.8	30.8	41.9	29.8	44.8	27.3
28	40.4	30.7	42.4	29.5	45.2	27.8
29	41.2	31.0	41.6	28.6	44.2	28.8
30	41.4	30.7	0.0	0.0	44.8	28.9
31	41.2	31.1	0.0	0.0	45.3	28.9
MEANS	42.4	30.3	42.5	29.9	43.9	28.3
OBSVNS.	31	31	29	29	31	31
MAXIMUM	44.7	31.4	43.4	31.5	45.3	30.7
MINIMUM	39.0	29.0	41.3	28.2	42.0	24.3
STD.DEV.	1.42	.60	.57	1.06	1.10	1.54

KAINS ISLAND

50 26 39 N

128 01 47 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.8	28.0	46.2	28.5	52.3	30.8
2	45.5	29.0	46.8	27.7	51.9	30.7
3	45.8	29.0	47.3	28.1	52.4	30.2
4	46.2	29.3	47.8	28.6	52.1	31.6
5	46.1	29.3	49.5	28.9	52.8	30.8
6	46.3	28.8	50.2	28.9	52.1	31.6
7	44.8	26.5	49.8	29.1	52.6	31.8
8	44.8	25.6	49.2	29.0	51.5	30.4
9	44.9	26.7	49.2	29.5	52.3	31.4
10	45.3	27.1	47.8	29.0	51.3	31.5
11	44.7	28.2	48.4	28.9	52.1	31.5
12	44.9	27.2	48.8	29.1	52.8	31.6
13	45.3	28.4	49.1	29.3	53.9	32.0
14	45.5	28.0	49.8	29.1	53.5	31.0
15	46.0	28.9	49.1	28.8	53.5	31.6
16	45.2	28.1	48.5	29.8	53.1	31.0
17	45.3	28.6	48.7	29.8	53.0	31.5
18	45.8	28.6	49.4	29.4	54.1	31.1
19	46.6	28.8	49.1	29.7	55.6	31.1
20	46.3	28.4	51.2	30.0	52.4	31.1
21	45.8	27.8	50.4	29.9	52.7	31.0
22	45.6	28.4	49.2	30.0	50.7	31.8
23	45.9	29.4	48.2	30.4	51.2	31.8
24	46.6	28.1	48.1	31.1	51.9	31.6
25	46.1	29.1	48.6	31.4	51.1	32.0
26	46.7	29.5	48.5	30.7	49.9	31.6
27	45.5	28.9	48.9	30.7	50.0	32.1
28	45.8	28.5	50.2	30.6	50.6	32.1
29	46.2	28.8	52.4	30.7	52.9	29.7
30	46.0	29.1	50.4	31.9	53.4	29.5
31	0.0	0.0	51.2	32.0	0.0	0.0
MEANS	45.7	28.3	49.1	29.7	52.3	31.2
OBSVNS.	30	30	31	31	30	30
MAXIMUM	46.7	29.5	52.4	32.0	55.6	32.1
MINIMUM	44.7	25.6	46.2	27.7	49.9	29.5
STD.DEV.	.56	.93	1.30	1.06	1.24	.66

KAINS ISLAND

50 26 39 N

128 01 47 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	54.1	30.8	54.8	32.4	56.3	32.0
2	53.2	31.9	56.5	32.1	54.2	32.1
3	54.4	31.1	56.5	32.3	54.8	32.0
4	53.8	31.9	56.4	32.4	56.2	32.1
5	57.1	31.2	56.8	32.1	54.1	32.1
6	53.6	31.5	55.9	33.0	53.8	32.1
7	52.5	31.6	55.8	33.0	54.0	31.9
8	50.8	32.1	56.1	32.3	53.4	32.0
9	52.7	32.3	56.4	32.4	52.7	32.0
10	53.7	32.5	53.2	32.8	53.3	32.1
11	54.6	32.3	52.8	32.8	53.0	32.0
12	54.8	32.0	53.2	32.5	53.3	32.4
13	55.0	32.1	52.3	32.5	54.8	31.9
14	55.7	31.0	54.6	32.1	54.0	31.9
15	55.8	31.4	54.4	32.1	52.8	32.1
16	56.4	32.1	53.8	32.0	52.8	32.0
17	56.8	32.4	53.7	32.5	52.7	32.0
18	56.2	32.4	56.1	32.0	51.8	31.9
19	53.9	32.7	56.7	32.1	51.5	31.6
20	55.4	33.0	57.3	32.3	51.7	31.8
21	54.8	32.5	57.1	32.1	52.3	30.3
22	54.7	32.3	57.2	31.4	51.6	30.4
23	55.2	32.1	58.4	31.2	51.7	30.7
24	55.6	32.0	57.6	31.1	51.9	31.0
25	56.4	32.0	58.3	31.2	51.4	31.1
26	56.8	32.4	58.4	31.4	50.7	31.4
27	56.5	32.8	57.0	31.9	50.6	31.6
28	56.8	32.7	56.6	32.1	50.8	31.6
29	57.6	32.3	56.2	31.9	51.4	31.4
30	57.6	32.3	55.9	32.0	51.7	31.5
31	57.8	32.4	55.2	31.9	0.0	0.0
MEANS	55.2	32.1	55.8	32.1	52.8	31.7
OBSVNS.	31	31	31	31	30	30
MAXIMUM	57.8	33.0	58.4	33.0	56.3	32.4
MINIMUM	50.8	30.8	52.3	31.1	50.6	30.3
STD.DEV.	1.67	.54	1.66	.49	1.51	.53

KAINS ISLAND

50 26 39 N

128 01 47 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.1	31.4	48.6	31.8	46.5	30.2
2	52.0	31.6	48.7	31.2	44.7	28.8
3	51.1	31.5	49.3	31.2	44.1	29.8
4	51.0	31.4	48.9	31.6	43.6	30.0
5	51.2	31.8	48.8	31.1	44.1	30.3
6	51.6	31.8	48.2	30.0	43.1	30.6
7	51.5	31.9	48.2	27.7	43.9	30.6
8	52.4	31.8	47.9	29.8	43.0	30.8
9	50.7	31.8	47.8	29.8	43.5	31.0
10	49.1	31.5	47.8	29.5	43.8	30.8
11	48.8	31.9	47.5	28.9	44.4	31.2
12	49.0	31.9	47.3	29.1	44.0	30.8
13	49.7	31.8	47.2	29.7	44.7	31.0
14	49.5	31.9	46.8	29.4	44.3	31.0
15	49.4	32.0	46.8	29.8	45.4	31.0
16	49.6	32.0	46.4	29.9	46.0	31.1
17	49.9	31.6	45.8	30.3	44.8	23.1
18	49.6	31.8	46.7	30.4	45.8	28.8
19	49.8	32.0	47.5	31.0	45.9	29.9
20	49.9	32.0	48.1	31.2	46.4	30.3
21	49.8	31.9	48.2	31.5	46.0	29.4
22	50.2	31.9	47.9	31.5	45.6	29.0
23	50.0	31.4	47.5	30.4	45.7	29.7
24	50.0	31.8	47.2	31.0	46.3	30.4
25	50.2	31.6	47.8	31.5	45.7	29.8
26	49.5	31.8	46.8	31.8	45.2	29.3
27	49.0	31.9	46.3	30.3	45.4	28.4
28	48.8	31.9	46.1	29.9	44.9	28.4
29	47.6	31.8	46.2	30.2	45.7	29.8
30	48.4	31.8	47.7	30.8	45.0	28.8
31	48.8	31.8	0.0	0.0	45.4	29.0
MEANS	50.0	31.8	47.5	30.4	45.0	29.8
OBSVNS.	31	31	30	30	31	31
YRLY. MEANS.....					48.5	30.5
MAXIMUM	52.4	32.0	49.3	31.8	46.5	31.2
MINIMUM	47.6	31.4	45.8	27.7	43.0	23.1
STD.DEV.	1.15	.18	.90	.98	1.01	1.51

AMPHITRITE POINT 48 55 16 N 125 32 17 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.7	29.4	40.4	28.5	44.6	28.8
2	45.4	29.3	40.1	28.5	44.8	28.4
3	43.1	28.8	40.4	28.6	44.6	28.9
4	* 43.7	* 28.4	40.4	28.8	44.7	28.8
5	44.3	28.1	40.8	28.5	44.8	27.3
6	45.2	29.4	41.3	28.4	44.4	27.1
7	44.0	27.3	41.5	19.5	44.3	25.5
8	45.3	28.9	41.8	27.1	43.2	22.5
9	46.6	31.6	41.6	27.7	44.2	20.0
10	46.2	31.1	42.3	29.0	45.7	26.7
11	45.7	29.9	42.7	29.1	45.6	26.5
12	45.0	30.3	42.2	23.9	46.5	25.8
13	42.7	29.8	43.0	28.5	47.0	24.7
14	42.8	29.0	41.9	28.5	46.7	24.0
15	43.7	28.2	43.2	29.1	46.7	23.3
16	44.6	28.1	44.2	29.9	47.6	22.7
17	45.3	30.8	43.1	28.1	46.8	15.4
18	43.5	29.5	43.3	26.8	47.6	21.7
19	* 44.2	* 29.0	44.3	28.8	48.1	27.1
20	44.8	28.4	43.9	27.7	48.5	26.0
21	44.8	30.2	43.8	26.7	47.4	19.7
22	45.1	29.3	43.8	27.3	47.2	26.1
23	* 43.6	* 28.4	42.7	23.0	46.6	26.8
24	42.2	27.6	43.4	26.0	46.2	23.8
25	40.6	28.4	43.6	27.1	45.4	25.2
26	39.8	27.8	43.6	27.4	46.6	26.1
27	39.3	28.4	44.0	26.7	46.7	25.6
28	40.3	28.5	44.7	28.1	47.4	25.5
29	40.2	28.2	45.1	29.0	47.6	26.0
30	40.8	28.8	0.0	0.0	47.3	26.7
31	41.1	28.8	0.0	0.0	47.0	27.2
MEANS	43.5	29.1	42.7	27.5	46.2	25.2
OBSVNS.	28	28	29	29	31	31
MAXIMUM	46.6	31.6	45.1	29.9	48.5	28.9
MINIMUM	39.3	27.3	40.1	19.5	43.2	15.4
STD.DEV.	2.17	1.06	1.41	2.14	1.35	2.97

AMPHITRITE POINT 48 55 16 N 125 32 17 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	46.8	27.6	46.8	26.0	52.2	30.6
2	47.6	27.1	48.1	29.1	51.6	31.0
3	47.6	27.4	48.8	28.8	50.3	31.2
4	46.7	27.2	49.0	29.3	52.3	30.7
5	46.8	29.8	49.3	29.9	51.5	31.5
6	47.2	29.4	50.0	28.9	50.7	31.4
7	46.4	28.8	49.6	29.3	49.9	31.8
8	46.0	27.7	49.3	29.8	50.2	31.6
9	46.0	26.7	49.1	30.0	52.8	31.1
10	46.3	24.2	49.6	30.0	52.3	31.0
11	45.8	23.7	50.7	28.4	51.3	31.1
12	46.5	23.7	51.5	28.8	51.6	31.9
13	46.9	26.8	50.7	30.7	54.3	31.5
14	* 47.2	* 26.6	50.1	30.3	54.3	30.0
15	47.5	26.5	50.3	29.4	54.0	30.3
16	46.8	27.7	50.8	29.9	53.7	31.1
17	47.3	28.8	48.4	31.0	55.2	29.7
18	48.7	27.3	* 48.4	* 31.2	53.3	31.1
19	47.2	28.9	48.3	31.5	53.2	31.2
20	47.0	29.4	48.1	31.4	51.6	31.8
21	46.3	29.0	52.7	29.8	54.1	31.1
22	46.4	29.4	49.8	30.8	50.7	31.6
23	47.0	29.3	51.3	29.4	54.2	30.8
24	47.2	29.1	50.7	30.2	53.4	31.2
25	47.6	29.0	51.4	30.0	52.3	31.6
26	47.4	26.7	51.5	30.3	53.0	31.1
27	48.5	28.5	52.7	30.2	51.7	31.1
28	48.1	28.0	54.5	30.4	53.4	29.0
29	48.0	30.0	54.3	30.3	53.7	30.2
30	48.3	30.0	52.9	31.5	55.1	30.2
31	0.0	0.0	53.8	30.2	0.0	0.0

MEANS	47.1	27.9	50.5	29.9	52.6	31.0
OBSVNS.	29	29	30	30	30	30

MAXIMUM	48.7	30.0	54.5	31.5	55.2	31.9
MINIMUM	45.8	23.7	46.8	26.0	49.9	29.0

STD.DEV.	.76	1.74	1.92	1.08	1.47	.66
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AMPHITRITE POINT 48 55 16 N 125 32 17 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	54.5	30.7	57.2	30.6	56.8	31.5
2	56.3	30.7	56.7	30.6	57.9	31.2
3	56.3	31.2	56.3	30.7	58.1	31.1
4	57.4	31.1	53.0	31.4	57.8	30.8
5	53.1	31.4	54.8	31.2	56.6	31.4
6	52.0	31.6	55.3	31.2	56.3	31.4
7	51.5	31.5	57.7	31.0	56.1	31.1
8	54.6	31.0	58.3	31.1	55.2	29.0
9	55.2	29.4	57.6	31.0	54.7	30.7
10	55.4	28.8	57.2	31.0	55.0	31.1
11	54.7	16.9	54.4	31.1	55.4	31.2
12	54.4	16.2	54.5	31.0	56.8	31.4
13	54.4	17.0	54.7	31.2	55.6	31.0
14	53.2	26.3	55.0	31.1	54.7	31.2
15	53.3	28.6	56.9	31.2	54.3	31.4
16	57.6	28.4	56.2	29.9	53.4	31.6
17	59.8	28.9	57.6	30.6	52.0	31.2
18	57.7	29.8	57.2	30.7	* 52.2	* 30.8
19	55.4	29.5	57.7	30.6	52.5	30.4
20	55.2	31.1	59.6	30.3	* 52.5	* 30.2
21	56.6	29.7	58.9	30.6	* 52.5	* 29.9
22	55.4	30.4	59.3	30.2	52.5	29.7
23	53.5	31.2	59.7	30.0	51.8	29.0
24	53.6	31.0	59.2	30.4	52.4	29.9
25	56.6	30.8	57.4	31.0	52.9	30.4
26	56.9	30.6	58.3	30.8	52.5	30.0
27	56.7	30.6	58.3	31.2	52.3	30.2
28	56.2	30.8	56.7	31.2	52.4	28.6
29	55.2	31.0	55.8	31.4	52.0	29.0
30	56.6	30.8	56.6	31.5	51.9	30.0
31	57.4	30.3	56.6	31.8	0.0	0.0

MEANS	55.4	28.9	56.9	30.9	54.4	30.6
OBSVNS.	31	31	31	31	27	27

MAXIMUM	59.8	31.6	59.7	31.8	58.1	31.6
MINIMUM	51.5	16.2	53.0	29.9	51.8	28.6

STD.DEV.	1.83	4.23	1.67	.44	2.10	.89
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AMPHITRITE POINT 48 55 16 N 125 32 17 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.2	30.2	48.6	30.3	49.2	29.9
2	52.7	29.8	48.7	30.7	48.3	30.3
3	52.9	29.9	48.2	30.8	46.4	29.4
4	52.3	29.9	48.3	31.2	46.3	30.2
5	51.6	30.3	48.3	27.4	* 45.8	* 30.0
6	51.4	30.0	48.1	30.7	45.2	29.9
7	52.6	30.6	48.2	30.0	45.3	30.2
8	52.8	30.3	48.5	29.9	45.2	30.6
9	51.2	31.4	48.6	29.9	45.2	30.6
10	50.9	31.2	49.1	30.0	45.3	27.8
11	51.7	31.0	49.3	28.2	44.2	29.8
12	51.9	31.1	48.7	28.2	45.3	30.2
13	51.7	31.1	49.1	29.5	44.9	30.3
14	52.2	31.0	48.8	29.5	* 44.4	* 30.2
15	* 51.8	* 31.2	48.4	29.7	43.8	30.2
16	51.5	31.4	48.2	29.8	* 45.0	* 29.6
17	51.0	31.2	47.6	29.0	46.2	29.0
18	50.8	31.5	47.6	28.8	45.6	22.7
19	50.7	31.2	48.4	29.8	46.4	31.5
20	50.4	29.0	48.8	30.6	46.3	27.8
21	50.3	29.5	49.3	30.6	46.6	29.3
22	49.4	30.8	48.9	29.9	46.4	28.0
23	49.6	31.0	49.5	29.1	47.2	30.3
24	49.7	30.4	48.3	28.9	47.2	29.4
25	50.0	30.3	48.8	29.8	47.3	29.7
26	49.4	30.8	48.9	30.4	47.4	29.8
27	49.5	31.0	* 48.6	* 29.2	47.0	28.0
28	49.3	31.2	48.2	28.1	46.3	27.8
29	48.9	30.8	48.2	29.8	45.6	25.1
30	48.9	30.7	47.8	28.8	47.7	28.6
31	48.4	30.8	0.0	0.0	46.3	26.3
MEANS	50.9	30.6	48.5	29.6	46.2	29.0
OBSVNS.	30	30	29	29	28	28
YRLY. MEANS.....					49.6	29.2
MAXIMUM	52.9	31.5	49.5	31.2	49.2	31.5
MINIMUM	48.4	29.0	47.6	27.4	43.8	22.7
STD.DEV.	1.32	.62	.48	.92	1.20	1.87

SHERINGHAM POINT 48 22 40 N 123 55 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.4	* 0.0	42.6	* 0.0	43.6	* 0.0
2	44.6	* 0.0	42.6	* 0.0	43.8	* 0.0
3	44.5	* 0.0	42.5	* 0.0	43.8	* 0.0
4	44.5	* 0.0	42.6	* 0.0	43.8	* 0.0
5	44.5	* 0.0	42.6	* 0.0	43.8	* 0.0
6	44.4	* 0.0	43.1	* 0.0	43.8	* 0.0
7	44.5	* 0.0	43.5	* 0.0	43.6	* 0.0
8	44.4	* 0.0	43.5	* 0.0	43.6	* 0.0
9	44.5	* 0.0	43.0	* 0.0	44.1	* 0.0
10	44.7	* 0.0	43.2	* 0.0	44.1	* 0.0
11	44.7	* 0.0	43.3	* 0.0	43.9	* 0.0
12	44.1	* 0.0	43.0	* 0.0	44.2	* 0.0
13	43.3	* 0.0	43.1	* 0.0	44.7	* 0.0
14	43.6	* 0.0	43.2	* 0.0	44.7	* 0.0
15	43.8	* 0.0	43.0	* 0.0	45.2	* 0.0
16	43.7	* 0.0	43.1	* 0.0	45.1	* 0.0
17	43.3	* 0.0	43.0	* 0.0	45.9	* 0.0
18	43.5	* 0.0	43.1	* 0.0	45.7	* 0.0
19	43.5	* 0.0	43.4	* 0.0	45.4	* 0.0
20	43.4	* 0.0	43.4	* 0.0	45.3	* 0.0
21	43.5	* 0.0	43.6	* 0.0	45.4	* 0.0
22	43.4	* 0.0	43.6	* 0.0	45.3	* 0.0
23	43.6	* 0.0	44.2	* 0.0	45.5	* 0.0
24	43.2	* 0.0	43.6	* 0.0	44.8	* 0.0
25	43.2	* 0.0	43.6	* 0.0	44.4	* 0.0
26	41.8	* 0.0	43.7	* 0.0	44.8	* 0.0
27	41.2	* 0.0	* 43.8	* 0.0	45.0	* 0.0
28	41.8	* 0.0	43.8	* 0.0	45.3	* 0.0
29	42.5	* 0.0	* 43.7	* 0.0	45.3	* 0.0
30	42.7	* 0.0	0.0	0.0	45.4	* 0.0
31	42.8	* 0.0	0.0	0.0	45.4	* 0.0
MEANS	43.6	0.0	43.2	0.0	44.7	0.0
OBSVNS.	31	0	27	0	31	0
MAXIMUM	44.7	0.0	44.2	0.0	45.9	0.0
MINIMUM	41.2	0.0	42.5	0.0	43.6	0.0
STD.DEV.	.92	0.00	.42	0.00	.74	0.00

SHERINGHAM POINT 48 22 40 N 123 55 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.7	* 0.0	47.0	* 0.0	49.2	* 0.0
2	45.2	* 0.0	47.2	* 0.0	49.1	* 0.0
3	45.4	* 0.0	47.1	* 0.0	49.1	* 0.0
4	45.3	* 0.0	48.0	* 0.0	48.9	* 0.0
5	45.5	* 0.0	47.9	* 0.0	48.9	* 0.0
6	45.5	* 0.0	47.9	* 0.0	49.2	* 0.0
7	45.8	* 0.0	48.2	* 0.0	49.7	* 0.0
8	45.3	* 0.0	47.2	* 0.0	49.4	* 0.0
9	45.2	* 0.0	47.2	* 0.0	49.4	* 0.0
10	46.0	* 0.0	48.5	* 0.0	49.2	* 0.0
11	45.8	* 0.0	48.4	* 0.0	49.4	* 0.0
12	45.5	* 0.0	48.4	* 0.0	49.0	* 0.0
13	45.8	* 0.0	48.5	* 0.0	49.2	* 0.0
14	45.6	* 0.0	48.5	* 0.0	49.2	* 0.0
15	46.4	* 0.0	48.5	* 0.0	49.4	* 0.0
16	45.8	* 0.0	47.9	* 0.0	49.5	* 0.0
17	46.5	* 0.0	48.4	* 0.0	48.8	* 0.0
18	46.5	* 0.0	48.7	* 0.0	51.3	* 0.0
19	46.3	* 0.0	49.1	* 0.0	51.5	* 0.0
20	46.2	* 0.0	49.2	* 0.0	50.4	* 0.0
21	45.8	* 0.0	49.1	* 0.0	51.2	* 0.0
22	45.8	* 0.0	48.9	* 0.0	50.8	* 0.0
23	45.6	* 0.0	49.1	* 0.0	50.8	* 0.0
24	45.8	* 0.0	48.9	* 0.0	50.7	* 0.0
25	45.8	* 0.0	48.9	* 0.0	50.4	* 0.0
26	45.8	* 0.0	50.8	* 0.0	50.3	* 0.0
27	46.0	* 0.0	50.5	* 0.0	50.0	* 0.0
28	46.3	* 0.0	50.8	* 0.0	50.0	* 0.0
29	47.6	* 0.0	50.4	* 0.0	50.3	* 0.0
30	47.2	* 0.0	50.4	* 0.0	49.2	* 0.0
31	0.0	0.0	48.7	* 0.0	0.0	0.0
MEANS	45.9	0.0	48.7	0.0	49.8	0.0
OBSVNS.	30	0	31	0	30	0
MAXIMUM	47.6	0.0	50.8	0.0	51.5	0.0
MINIMUM	45.2	0.0	47.0	0.0	48.8	0.0
STD.DEV.	.55	0.00	1.06	0.00	.80	0.00

SHERINGHAM POINT 48 22 40 N 123 55 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	49.8	* 0.0	52.5	* 0.0	52.4	* 0.0
2	49.7	* 0.0	52.5	* 0.0	52.1	* 0.0
3	49.8	* 0.0	50.3	* 0.0	52.4	* 0.0
4	50.2	* 0.0	51.4	* 0.0	52.1	* 0.0
5	51.7	* 0.0	51.4	* 0.0	52.3	* 0.0
6	49.7	* 0.0	54.0	* 0.0	52.0	* 0.0
7	49.9	* 0.0	53.7	* 0.0	52.3	* 0.0
8	51.6	* 0.0	54.3	* 0.0	52.3	* 0.0
9	* 50.6	* 0.0	53.5	* 0.0	52.1	* 0.0
10	49.5	* 0.0	54.2	* 0.0	52.3	* 0.0
11	50.0	* 0.0	54.1	* 0.0	52.1	* 0.0
12	50.5	* 0.0	54.0	* 0.0	51.9	* 0.0
13	49.0	* 0.0	54.1	* 0.0	51.7	* 0.0
14	50.0	* 0.0	54.1	* 0.0	51.6	* 0.0
15	51.0	* 0.0	54.2	* 0.0	51.4	* 0.0
16	49.7	* 0.0	53.0	* 0.0	51.2	* 0.0
17	52.2	* 0.0	53.5	* 0.0	51.3	* 0.0
18	51.9	* 0.0	53.7	* 0.0	51.3	* 0.0
19	54.5	* 0.0	53.4	* 0.0	51.4	* 0.0
20	56.5	* 0.0	53.6	* 0.0	51.2	* 0.0
21	48.6	* 0.0	53.4	* 0.0	51.1	* 0.0
22	55.4	* 0.0	53.0	* 0.0	51.0	* 0.0
23	53.2	* 0.0	52.6	* 0.0	51.1	* 0.0
24	52.8	* 0.0	52.7	* 0.0	49.3	* 0.0
25	52.2	* 0.0	52.2	* 0.0	49.7	* 0.0
26	53.0	* 0.0	51.9	* 0.0	49.8	* 0.0
27	51.5	* 0.0	51.9	* 0.0	49.7	* 0.0
28	50.5	* 0.0	52.1	* 0.0	48.8	* 0.0
29	51.0	* 0.0	50.7	* 0.0	49.4	* 0.0
30	52.1	* 0.0	51.4	* 0.0	49.4	* 0.0
31	50.7	* 0.0	52.0	* 0.0	0.0	0.0
MEANS	51.3	0.0	52.9	0.0	51.2	0.0
OBSVNS.	30	0	31	0	30	0
MAXIMUM	56.5	0.0	54.3	0.0	52.4	0.0
MINIMUM	48.6	0.0	50.3	0.0	48.8	0.0
STD.DEV.	1.88	0.00	1.12	0.00	1.10	0.00

SHERINGHAM POINT 48 22 40 N 123 55 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	49.5	* 0.0	47.2	* 0.0	* 46.6	* 0.0
2	49.4	* 0.0	47.8	* 0.0	* 46.0	* 0.0
3	49.2	* 0.0	47.8	* 0.0	* 46.0	* 0.0
4	49.2	* 0.0	47.8	* 0.0	* 44.9	* 0.0
5	49.6	* 0.0	47.3	* 0.0	* 44.7	* 0.0
6	49.7	* 0.0	47.3	* 0.0	* 44.0	* 0.0
7	49.8	* 0.0	47.3	* 0.0	* 44.4	* 0.0
8	49.7	* 0.0	47.7	* 0.0	* 44.8	* 0.0
9	49.8	* 0.0	47.5	* 0.0	* 44.5	* 0.0
10	49.7	* 0.0	47.5	* 0.0	* 44.6	* 0.0
11	49.7	* 0.0	47.4	* 0.0	* 44.5	* 0.0
12	49.7	* 0.0	47.4	* 0.0	* 44.6	* 0.0
13	49.4	* 0.0	47.5	* 0.0	* 44.5	* 0.0
14	49.4	* 0.0	47.4	* 0.0	* 44.5	* 0.0
15	49.0	* 0.0	48.5	* 0.0	* 44.5	* 0.0
16	49.7	* 0.0	47.8	* 0.0	* 45.1	* 0.0
17	49.5	* 0.0	47.5	* 0.0	* 44.8	* 0.0
18	49.5	* 0.0	47.5	* 0.0	* 44.8	* 0.0
19	49.4	* 0.0	47.6	* 0.0	* 44.9	* 0.0
20	49.5	* 0.0	47.4	* 0.0	* 44.9	* 0.0
21	49.3	* 0.0	47.5	* 0.0	* 45.1	* 0.0
22	49.4	* 0.0	47.4	* 0.0	* 45.8	* 0.0
23	49.4	* 0.0	47.2	* 0.0	* 45.8	* 0.0
24	48.3	* 0.0	47.1	* 0.0	* 0.0	* 0.0
25	47.7	* 0.0	46.9	* 0.0	* 0.0	* 0.0
26	47.5	* 0.0	46.9	* 0.0	* 0.0	* 0.0
27	47.5	* 0.0	47.0	* 0.0	* 45.8	* 0.0
28	47.6	* 0.0	47.2	* 0.0	* 45.8	* 0.0
29	47.5	* 0.0	47.1	* 0.0	* 45.8	* 0.0
30	47.6	* 0.0	47.1	* 0.0	45.8	* 0.0
31	47.5	* 0.0	0.0	0.0	45.8	* 0.0

MEANS	49.0	0.0	47.4	0.0	45.8	0.0
OBSVNS.	31	0	30	0	2	0
YRLY. MEANS.....					48.0	0.0
MAXIMUM	49.8	0.0	48.5	0.0	45.8	0.0
MINIMUM	47.5	0.0	46.9	0.0	45.8	0.0
STD.DEV.	.85	0.00	.33	0.00	0.00	0.00

RACE ROCKS

48 17 57 N

123 31 48 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.8	30.7	42.7	31.0	43.7	30.4
2	44.4	31.2	42.7	31.2	43.7	30.7
3	44.3	31.1	42.6	30.7	43.7	31.1
4	44.5	31.1	* 42.6	* 30.6	43.6	30.8
5	44.5	31.1	42.6	30.6	* 43.6	* 30.9
6	44.2	31.4	42.7	30.8	43.5	31.0
7	44.3	31.4	43.0	30.8	43.2	30.6
8	44.1	31.1	43.3	30.6	43.2	30.3
9	43.8	30.8	43.0	31.1	43.6	29.8
10	43.6	30.8	42.8	30.4	44.0	29.8
11	43.5	30.7	43.1	30.8	43.8	29.8
12	* 43.4	* 30.6	43.3	31.1	44.2	29.5
13	43.3	30.4	43.6	31.2	44.5	30.0
14	43.3	30.2	43.3	31.5	44.9	29.1
15	43.9	30.8	43.7	31.4	45.1	29.7
16	43.9	30.7	43.8	31.6	45.0	30.0
17	43.8	30.7	43.5	31.0	45.3	29.9
18	43.5	31.2	44.0	30.7	45.6	29.8
19	43.8	31.1	44.0	30.8	45.1	30.0
20	44.2	31.9	43.9	31.4	44.5	29.7
21	44.2	30.8	43.6	31.6	44.6	30.0
22	44.2	31.0	43.3	30.7	44.8	29.8
23	43.7	31.0	43.3	30.7	44.4	29.9
24	43.3	30.4	43.4	30.7	44.6	29.8
25	* 42.8	* 30.6	43.5	30.6	44.5	29.7
26	42.4	30.8	43.5	30.3	44.7	29.9
27	42.2	31.2	43.7	30.7	45.0	29.9
28	42.4	31.1	43.8	30.4	45.8	29.8
29	43.0	31.2	43.7	30.8	* 45.5	* 29.9
30	42.7	30.3	0.0	0.0	45.2	30.0
31	42.8	31.6	0.0	0.0	45.3	30.0

MEANS	43.7	31.0	43.3	30.9	44.5	30.0
OBSVNS.	29	29	28	28	29	29

MAXIMUM	44.8	31.9	44.0	31.6	45.8	31.1
MINIMUM	42.2	30.2	42.6	30.3	43.2	29.1

STD.DEV.	.69	.38	.44	.36	.73	.45
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RACE ROCKS

48 17 57 N

123 31 48 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.6	30.2	46.5	31.0	48.2	30.7
2	* 45.6	* 30.2	47.2	30.8	48.6	30.4
3	45.6	30.3	46.7	31.0	48.7	30.4
4	45.8	30.0	46.4	30.6	48.5	30.6
5	45.7	30.2	46.7	30.4	49.2	30.4
6	45.2	30.2	46.5	30.7	48.9	30.7
7	45.1	29.9	46.6	30.6	49.2	30.3
8	45.0	29.8	46.8	30.4	50.1	30.3
9	45.0	29.8	46.9	30.6	49.3	30.6
10	45.4	30.0	47.7	30.4	48.2	30.7
11	45.5	30.0	47.5	30.3	48.9	31.1
12	45.6	30.2	48.2	31.0	47.8	31.0
13	45.9	30.3	47.7	31.1	48.6	31.0
14	46.2	30.4	46.8	31.6	48.1	31.2
15	46.0	30.7	47.1	31.2	48.4	31.1
16	45.8	30.4	47.3	31.6	* 48.6	* 31.0
17	45.9	30.6	47.4	31.5	48.8	31.0
18	46.1	30.4	47.2	31.5	50.2	30.3
19	46.2	30.6	48.3	31.0	50.3	30.4
20	45.8	30.6	48.3	31.0	50.0	30.0
21	45.1	30.0	48.6	30.4	50.1	29.7
22	45.5	30.4	48.8	30.6	* 50.0	* 29.4
23	46.0	30.3	49.2	30.0	50.0	29.0
24	46.6	30.3	49.3	30.2	50.8	28.8
25	46.7	30.4	49.5	29.9	50.0	29.3
26	46.3	30.2	49.9	30.0	49.3	29.5
27	46.7	30.3	50.2	30.3	49.6	29.8
28	46.2	30.3	49.0	30.3	49.8	30.0
29	46.1	30.6	48.8	30.4	49.1	30.7
30	46.3	30.6	48.9	30.4	49.3	30.6
31	0.0	0.0	48.4	30.7	0.0	0.0

MEANS	45.8	30.3	47.9	30.7	49.2	30.3
OBSVNS.	29	29	31	31	28	28

MAXIMUM	46.7	30.7	50.2	31.6	50.8	31.2
MINIMUM	45.0	29.8	46.4	29.9	47.8	28.8

STD.DEV.	.49	.25	1.11	.47	.78	.63
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RACE ROCKS

48 17 57 N

123 31 48 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	49.5	30.8	50.3	30.6	51.0	30.3
2	51.3	30.7	51.3	30.0	51.6	30.6
3	50.2	30.3	51.5	29.5	52.1	30.8
4	51.0	29.3	51.3	30.0	51.5	30.7
5	51.3	29.1	51.3	30.2	51.4	30.4
6	51.9	29.4	52.3	30.6	51.5	30.6
7	51.5	29.0	51.6	30.4	51.0	30.8
8	50.5	29.9	50.6	30.7	* 51.0	* 30.8
9	49.7	29.0	50.3	31.0	51.0	30.8
10	49.6	29.1	50.4	31.0	51.2	31.0
11	48.5	31.1	50.7	30.8	50.1	31.4
12	48.2	31.1	50.7	30.6	50.6	30.7
13	48.6	31.1	50.7	30.7	50.8	31.0
14	48.8	31.2	51.5	30.6	51.5	30.3
15	49.3	31.2	50.6	30.4	50.6	31.8
16	50.8	30.7	50.8	30.2	50.6	30.6
17	49.7	30.8	52.3	29.8	51.8	30.6
18	51.0	29.8	52.9	29.5	51.6	30.3
19	56.2	27.3	52.2	29.7	51.7	30.0
20	56.5	27.3	52.8	29.5	51.2	30.2
21	55.0	27.3	53.0	29.5	50.5	30.4
22	53.1	27.8	52.8	30.0	49.7	30.7
23	53.0	28.2	52.3	30.2	49.3	31.4
24	51.6	28.9	51.3	30.6	49.1	31.6
25	51.7	29.4	50.2	31.0	49.1	31.1
26	51.3	30.6	50.6	31.0	48.9	31.1
27	50.5	30.8	50.9	31.2	48.7	31.5
28	50.2	30.8	50.9	31.1	48.7	31.2
29	49.8	31.0	50.2	30.8	49.3	31.0
30	50.6	30.7	49.6	30.7	48.8	31.4
31	50.7	30.7	50.8	30.4	0.0	0.0
MEANS	51.0	29.8	51.2	30.4	50.5	30.8
OBSVNS.	31	31	31	31	29	29
MAXIMUM	56.5	31.2	53.0	31.2	52.1	31.8
MINIMUM	48.2	27.3	49.6	29.5	48.7	30.0
STD.DEV.	2.02	1.26	.92	.52	1.09	.46

RACE ROCKS

48 17 57 N

123 31 48 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	49.7	31.1	47.4	31.9	47.0	31.6
2	49.5	31.0	48.0	32.3	46.5	31.4
3	49.4	31.1	47.8	32.1	46.2	31.5
4	50.0	31.0	47.8	31.4	45.0	31.2
5	49.6	30.7	47.6	31.6	45.3	31.4
6	49.9	30.7	47.5	31.9	* 45.0	* 31.5
7	49.3	30.8	47.6	31.6	* 44.7	* 31.6
8	49.0	31.6	47.5	32.0	44.4	31.6
9	49.6	31.0	47.3	32.3	45.0	31.6
10	48.7	31.1	47.6	32.0	45.1	31.9
11	* 48.2	* 31.2	47.5	32.1	44.6	32.0
12	47.8	31.4	47.3	32.0	44.7	32.0
13	47.7	31.0	47.4	31.6	44.9	31.6
14	48.5	31.2	47.3	31.6	44.6	31.9
15	48.3	31.4	47.4	31.8	44.5	31.5
16	49.0	31.0	47.1	32.0	45.0	31.6
17	49.3	31.4	47.0	31.5	44.9	31.5
18	48.8	31.2	47.3	31.2	45.1	31.8
19	48.5	31.0	47.5	31.4	45.3	31.5
20	48.5	31.1	47.0	32.3	* 45.4	* 31.5
21	48.2	31.2	47.2	31.6	45.5	31.5
22	48.3	31.4	47.1	31.9	45.6	32.1
23	48.2	32.0	47.1	31.9	45.7	31.8
24	47.8	31.4	47.2	31.6	45.6	31.4
25	47.7	31.9	46.9	31.8	45.5	31.2
26	47.7	32.0	46.6	31.9	45.6	31.2
27	* 47.2	* 32.2	46.5	32.0	45.4	31.2
28	46.6	32.4	46.3	31.6	45.2	31.4
29	47.2	32.1	46.6	31.6	45.5	31.4
30	47.1	32.4	46.9	31.4	45.0	31.0
31	47.3	31.5	0.0	0.0	45.1	31.0

MEANS	48.5	31.3	47.2	31.8	45.3	31.5
OBSVNS.	29	29	30	30	28	28
YRLY. MEANS.....					47.4	30.7
MAXIMUM	50.0	32.4	48.0	32.3	47.0	32.1
MINIMUM	46.6	30.7	46.3	31.2	44.4	31.0
STD.DEV.	.92	.47	.40	.29	.59	.29

CAPE MUDGE

49 59 56 N

125 11 38 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.2	28.4	36.5	29.1	41.0	28.4
2	41.9	28.5	42.0	29.7	* 42.2	* 29.0
3	41.2	28.6	43.2	29.7	43.4	29.7
4	42.5	28.5	44.1	29.7	44.9	30.0
5	43.3	28.8	44.3	29.9	* 45.0	* 30.0
6	41.5	29.4	* 44.0	* 29.7	45.0	29.9
7	* 42.7	* 29.2	43.8	29.5	45.0	29.9
8	43.9	29.1	43.9	29.7	44.8	29.7
9	43.4	28.6	44.9	29.5	* 44.6	* 29.7
10	42.9	28.8	44.4	29.4	44.5	29.7
11	43.4	29.0	46.1	29.4	46.0	29.3
12	42.1	28.9	45.5	29.5	45.5	29.1
13	44.1	29.7	45.6	29.4	46.0	29.5
14	43.6	29.4	* 44.8	* 29.3	45.5	28.9
15	43.1	28.8	* 43.9	* 29.1	45.6	28.5
16	45.5	29.7	43.0	29.0	47.4	29.7
17	45.0	29.7	43.8	29.7	46.1	29.0
18	41.0	29.0	44.5	29.5	45.5	29.4
19	41.1	28.6	45.0	29.7	45.2	28.0
20	* 42.3	* 29.0	44.5	29.8	45.0	28.6
21	43.5	29.4	* 44.8	* 29.6	45.7	29.0
22	42.6	29.3	45.0	29.5	45.7	29.0
23	43.0	29.4	* 45.0	* 29.4	45.5	28.5
24	42.5	28.9	45.0	29.3	46.0	28.5
25	* 42.8	* 29.0	45.5	29.7	47.0	28.8
26	43.0	29.1	* 45.6	* 29.8	48.0	28.1
27	44.0	29.5	45.6	29.8	48.8	27.6
28	44.5	29.5	42.0	28.9	50.0	28.6
29	44.9	29.5	41.1	28.8	48.8	28.8
30	45.0	29.3	0.0	0.0	50.0	28.9
31	44.0	29.5	0.0	0.0	* 47.7	* 28.8

MEANS	43.2	29.1	43.9	29.5	46.0	29.0
OBSVNS.	28	28	23	23	27	27
MAXIMUM	45.5	29.7	46.1	29.9	50.0	30.0
MINIMUM	41.0	28.4	36.5	28.8	41.0	27.6
STD.DEV.	1.21	.41	2.05	.30	1.92	.63

CAPE MUDGE

49 59 56 N

125 11 38 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 45.3	* 28.6	46.5	28.2	49.6	29.0
2	43.0	28.5	46.1	28.8	51.4	27.8
3	45.1	29.1	46.8	28.9	53.0	28.1
4	46.0	29.3	47.0	29.1	53.2	28.4
5	* 45.6	* 29.0	47.5	29.0	55.0	28.5
6	45.1	28.6	48.4	28.9	62.5	26.1
7	45.0	28.6	50.2	29.7	66.0	27.1
8	46.6	29.0	53.5	28.9	63.5	26.7
9	* 0.0	* 0.0	53.6	29.4	57.5	26.7
10	* 0.0	* 0.0	51.6	29.4	54.0	16.9
11	* 0.0	* 0.0	50.5	29.5	57.4	24.8
12	50.1	28.6	52.2	29.3	56.0	26.1
13	46.7	28.2	50.6	29.1	55.5	26.4
14	46.4	27.8	50.7	29.1	58.0	24.6
15	47.2	28.4	49.7	29.3	56.1	25.2
16	44.6	29.4	49.7	29.1	57.6	23.4
17	44.7	29.1	49.4	29.1	57.0	23.3
18	45.9	29.4	48.5	28.9	60.0	23.7
19	46.0	29.1	49.1	28.9	60.0	25.2
20	46.0	29.1	52.1	29.4	57.8	26.7
21	47.4	28.9	51.4	28.4	59.4	27.4
22	49.8	29.0	53.7	28.9	53.6	27.1
23	47.9	29.4	53.5	28.9	58.0	27.4
24	49.0	28.9	56.0	29.1	55.2	26.9
25	50.0	28.8	55.2	29.5	59.5	26.1
26	50.8	29.0	53.4	29.4	54.9	26.0
27	* 49.2	* 28.8	53.1	29.4	* 56.4	* 25.6
28	47.5	28.6	57.8	29.0	58.0	25.2
29	49.1	28.9	52.6	28.1	55.0	24.6
30	* 47.8	* 28.6	54.3	29.0	54.5	23.9
31	0.0	0.0	55.0	28.1	0.0	0.0
MEANS	47.0	28.9	51.3	29.0	56.9	25.8
OBSVNS.	23	23	31	31	29	29
MAXIMUM	50.8	29.4	57.8	29.7	66.0	29.0
MINIMUM	43.0	27.8	46.1	28.1	49.6	16.9
STD.DEV.	2.06	.40	3.00	.40	3.54	2.32

CAPE MUDGE

49 59 56 N

125 11 38 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	53.4	25.8	55.6	26.5	51.9	28.6
2	51.2	27.7	55.8	26.9	54.2	27.3
3	56.4	25.2	59.8	27.1	54.4	27.7
4	59.8	25.5	61.0	26.4	55.0	27.8
5	61.6	25.1	60.2	27.7	55.4	27.7
6	61.1	26.0	65.2	25.8	51.3	28.6
7	55.6	26.1	56.2	26.0	52.5	28.8
8	* 57.6	* 25.8	56.5	26.1	49.7	28.9
9	59.6	25.6	61.4	26.7	53.4	27.8
10	59.5	23.8	55.1	26.5	55.3	27.7
11	* 58.8	* 23.7	50.1	28.8	53.1	28.2
12	58.2	23.5	49.5	28.5	51.5	28.4
13	60.5	23.4	51.6	28.9	51.6	28.6
14	61.4	23.8	52.2	28.0	54.5	27.6
15	61.8	24.4	52.1	28.0	55.2	27.4
16	56.9	25.6	55.2	25.1	52.9	27.7
17	* 56.0	* 25.2	53.6	27.4	54.4	27.7
18	55.0	24.8	60.0	26.7	51.0	28.4
19	62.5	26.5	65.1	25.6	53.8	28.5
20	61.8	26.1	65.0	25.8	* 52.6	* 28.5
21	62.5	25.1	59.6	26.9	51.5	28.5
22	62.3	24.3	62.6	26.3	52.4	28.1
23	63.8	25.1	62.1	26.0	54.2	28.4
24	60.2	25.4	62.4	25.5	53.0	28.6
25	59.8	25.4	59.2	26.5	52.0	28.5
26	64.1	25.5	57.4	26.1	50.3	28.4
27	65.5	24.7	54.8	26.0	49.0	28.6
28	60.1	25.4	54.0	26.3	49.5	28.5
29	63.2	25.2	52.6	26.8	51.0	27.7
30	58.2	24.8	58.2	26.9	51.5	28.1
31	54.1	26.4	52.2	28.6	0.0	0.0
MEANS	59.6	25.2	57.3	26.8	52.6	28.2
OBSVNS.	28	28	31	31	29	29
MAXIMUM	65.5	27.7	65.2	28.9	55.4	28.9
MINIMUM	51.2	23.4	49.5	25.1	49.0	27.3
STD.DEV.	3.49	.96	4.53	1.01	1.83	.45

CAPE MUDGE

49 59 56 N

125 11 38 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.6	28.2	47.2	29.3	46.0	28.9
2	50.5	28.5	48.0	29.7	* 46.2	* 29.4
3	52.2	28.4	48.5	29.1	46.4	29.8
4	51.8	29.0	48.6	29.7	45.5	29.7
5	51.2	28.9	47.4	29.5	45.7	30.2
6	51.0	29.1	47.9	29.4	42.9	30.2
7	51.1	29.4	47.6	29.5	38.5	29.1
8	50.0	28.6	* 47.8	* 29.4	43.0	29.5
9	47.2	29.1	47.9	29.3	39.7	29.1
10	47.2	29.0	47.9	29.3	* 39.8	* 28.8
11	47.2	29.3	46.5	29.0	40.0	28.5
12	46.5	28.9	47.2	29.4	42.6	29.3
13	48.2	28.8	* 46.8	* 29.0	42.6	29.4
14	48.4	28.9	46.5	28.5	43.2	29.4
15	49.1	29.0	47.1	29.1	* 0.0	* 0.0
16	49.8	28.8	47.3	29.0	* 0.0	* 0.0
17	49.9	28.9	46.8	28.8	* 0.0	* 0.0
18	* 50.0	* 29.0	47.0	29.4	* 0.0	* 0.0
19	50.0	29.1	48.0	29.5	45.9	29.5
20	* 49.2	* 29.3	46.5	29.4	* 45.8	* 29.6
21	48.5	29.5	47.4	29.9	45.6	29.7
22	48.6	29.3	* 47.2	* 29.8	46.7	29.8
23	48.8	29.5	47.1	29.7	45.5	28.8
24	47.9	29.7	* 46.6	* 29.6	44.8	28.8
25	47.6	29.3	* 46.0	* 29.5	* 45.0	* 29.1
26	46.8	29.4	45.5	29.4	45.1	29.4
27	47.5	29.1	46.0	29.4	45.4	29.0
28	47.8	29.5	45.5	29.5	45.2	28.9
29	47.3	29.5	46.5	29.7	* 45.2	* 29.0
30	47.7	29.7	46.4	29.5	45.1	29.1
31	46.9	29.4	0.0	0.0	44.6	28.6

MEANS	48.9	29.1	47.1	29.4	44.1	29.3
OBSVNS.	29	29	25	25	22	22
YRLY. MEANS.....					50.2	28.2
MAXIMUM	52.6	29.7	48.6	29.9	46.7	30.2
MINIMUM	46.5	28.2	45.5	28.5	38.5	28.5
STD.DEV.	1.77	.38	.83	.31	2.28	.47

SISTERS ISLAND

49 29 13

124 26 00 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.8	28.9	42.0	29.3	42.5	29.1
2	43.5	29.0	41.9	29.3	43.2	29.1
3	43.0	29.4	42.2	29.4	43.2	29.4
4	43.0	29.1	42.0	29.4	42.9	29.3
5	43.0	29.0	41.9	29.3	43.4	29.3
6	42.8	29.0	42.2	29.4	43.1	29.1
7	42.8	29.1	42.5	29.3	42.9	29.1
8	42.8	29.1	42.5	29.4	43.0	28.9
9	43.0	29.1	42.6	29.7	43.2	28.9
10	42.9	29.1	42.8	29.5	43.7	28.9
11	43.5	29.1	42.8	29.4	44.4	29.1
12	43.5	29.0	43.5	29.4	44.4	29.3
13	43.0	29.4	43.2	29.4	44.9	29.0
14	43.2	29.4	43.5	29.5	44.1	28.8
15	43.2	29.3	43.7	29.4	44.3	28.9
16	43.3	29.3	43.4	29.3	44.9	27.8
17	42.8	29.3	42.8	29.3	44.5	27.4
18	42.7	29.1	43.0	29.0	44.6	27.7
19	42.9	29.1	43.3	29.3	44.4	27.4
20	43.3	29.4	42.6	29.1	44.6	27.4
21	43.1	29.1	43.6	29.4	44.7	26.9
22	43.2	29.4	42.8	29.3	45.4	25.9
23	* 43.0	* 29.2	43.0	29.0	45.0	26.3
24	42.9	29.1	43.1	29.1	44.6	26.9
25	43.1	29.4	43.2	29.1	45.3	27.1
26	42.0	29.1	43.2	29.1	45.9	25.0
27	42.1	29.1	44.3	29.5	45.8	25.4
28	42.3	29.3	42.9	29.1	44.5	25.5
29	41.9	29.1	42.8	29.1	45.1	24.8
30	41.9	29.1	0.0	0.0	45.5	25.2
31	42.0	29.3	0.0	0.0	45.9	26.3
MEANS	42.9	29.2	42.9	29.3	44.3	27.7
OBSVNS.	30	30	29	29	31	31
MAXIMUM	43.8	29.4	44.3	29.7	45.9	29.4
MINIMUM	41.9	28.9	41.9	29.0	42.5	24.8
STD.DEV.	.50	.15	.59	.17	.98	1.53

SISTERS ISLAND

49 29 13

124 26 00 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.3	26.5	47.1	27.4	57.9	23.7
2	44.9	27.8	46.7	28.0	57.3	24.4
3	44.9	27.4	48.0	27.4	58.0	25.8
4	45.7	27.3	49.4	27.6	59.0	23.8
5	45.9	27.8	51.1	27.8	60.1	22.7
6	45.3	27.8	52.5	27.6	61.5	22.2
7	45.3	27.7	52.8	27.4	61.9	23.7
8	45.2	27.7	51.7	27.8	64.5	23.9
9	45.1	27.7	52.3	27.8	61.8	23.4
10	45.1	27.2	51.7	27.6	57.5	25.4
11	45.0	27.7	52.2	27.6	59.9	18.7
12	45.9	27.1	53.8	27.6	60.7	20.3
13	45.0	24.3	52.7	27.7	59.9	14.9
14	45.0	24.8	53.2	27.7	59.0	15.3
15	45.0	26.1	52.6	27.3	58.0	15.7
16	45.0	25.6	52.5	27.4	58.4	17.6
17	45.0	26.9	51.5	27.8	58.5	17.9
18	45.1	27.1	51.0	27.8	59.8	17.3
19	45.6	27.1	53.2	27.7	59.5	21.2
20	45.9	26.8	52.5	27.7	59.4	21.8
21	47.8	27.6	54.1	27.4	60.9	22.1
22	46.9	28.0	54.1	27.6	59.4	22.1
23	46.8	28.0	52.6	27.6	60.0	24.0
24	48.0	27.7	55.1	27.6	59.3	23.4
25	47.7	28.0	57.3	27.7	60.5	22.5
26	46.9	27.7	56.4	27.6	59.0	19.4
27	49.3	27.8	57.8	27.4	57.4	20.6
28	46.8	27.7	59.4	25.0	59.0	17.6
29	46.9	27.7	60.4	19.7	59.2	17.9
30	47.3	27.4	52.4	20.8	57.7	18.6
31	0.0	0.0	56.2	26.7	0.0	0.0

MEANS	46.0	27.2	53.0	27.0	59.5	20.9
OBSVNS.	30	30	31	31	30	30

MAXIMUM	49.3	28.0	60.4	28.0	64.5	25.8
MINIMUM	44.9	24.3	46.7	19.7	57.3	14.9

STD.DEV.	1.17	.92	3.14	1.89	1.58	3.12
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SISTERS ISLAND

49 29 13

124 26 00 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	57.0	22.0	62.8	23.8	61.1	26.1
2	57.2	23.8	63.1	23.8	62.7	26.0
3	60.0	22.0	65.6	23.9	63.8	25.8
4	62.3	23.4	67.2	23.8	64.4	26.1
5	61.4	23.4	65.4	24.0	60.5	26.8
6	64.0	22.7	66.3	24.2	58.1	26.9
7	62.5	22.1	67.6	23.9	59.6	26.4
8	58.8	24.0	66.3	24.2	59.5	25.6
9	57.4	24.0	64.4	25.0	58.4	25.9
10	56.9	20.6	63.8	24.8	58.5	26.1
11	* 56.2	* 22.0	64.2	24.8	57.5	26.1
12	55.5	23.3	65.0	25.2	58.7	26.5
13	59.4	18.3	64.0	25.0	58.7	26.7
14	62.1	17.9	62.4	25.1	59.0	26.8
15	58.8	23.3	61.4	25.1	58.4	26.8
16	59.0	23.8	61.8	24.3	59.0	26.8
17	60.0	23.0	62.6	23.9	57.9	27.1
18	57.2	25.0	62.7	23.4	54.3	27.6
19	62.1	23.4	64.4	23.4	55.9	27.3
20	63.4	24.2	65.4	23.3	51.5	27.4
21	64.4	23.8	64.6	22.9	51.8	28.0
22	64.9	24.4	66.9	23.3	50.5	28.2
23	64.2	24.3	66.0	23.4	52.1	27.8
24	63.3	23.9	66.9	23.7	52.5	27.6
25	62.5	22.6	66.6	23.7	52.6	25.9
26	63.9	22.1	66.7	24.2	51.6	27.3
27	63.0	21.3	65.5	25.0	51.5	27.6
28	63.9	21.3	65.6	25.0	50.8	27.4
29	64.6	22.2	62.3	25.8	52.4	27.1
30	64.5	22.6	59.2	26.0	53.1	27.1
31	62.6	24.2	57.2	26.5	0.0	0.0
MEANS	61.2	22.8	64.3	24.3	56.5	26.8
OBSVNS.	30	30	31	31	30	30
MAXIMUM	64.9	25.0	67.6	26.5	64.4	28.2
MINIMUM	55.5	17.9	57.2	22.9	50.5	25.6
STD.DEV.	2.85	1.65	2.39	.87	4.14	.71

SISTERS ISLAND

49 29 13

124 26 00 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	53.3	27.6	48.0	28.9	46.3	28.8
2	52.8	27.8	48.3	28.9	45.9	28.9
3	51.8	27.8	48.2	29.0	45.5	29.1
4	51.7	28.0	48.7	28.9	45.1	29.1
5	52.1	27.7	48.1	28.9	45.0	29.0
6	53.1	27.7	48.0	28.9	44.4	29.1
7	54.0	27.6	47.9	29.0	43.7	29.1
8	52.6	27.7	47.9	28.9	43.0	29.1
9	50.3	28.5	47.7	28.1	43.0	29.1
10	50.0	28.4	47.7	28.9	43.2	29.4
11	49.5	27.8	47.4	28.5	43.6	29.1
12	50.1	28.2	47.3	27.4	43.2	29.1
13	50.5	28.4	47.5	28.5	43.2	29.1
14	50.8	28.1	47.5	28.6	43.1	29.1
15	50.6	28.2	47.0	28.1	43.3	29.4
16	51.0	28.2	46.5	28.2	44.8	29.3
17	50.8	28.2	46.7	28.2	45.0	29.3
18	50.8	28.0	47.0	28.6	46.5	29.7
19	50.5	28.2	47.0	28.4	45.5	29.4
20	50.0	28.2	46.2	28.5	45.6	29.3
21	50.2	28.2	46.9	28.9	45.0	29.4
22	50.2	28.5	46.7	28.9	44.8	29.3
23	50.1	28.5	47.0	28.8	45.5	29.4
24	49.9	28.5	46.6	28.9	44.9	29.3
25	49.5	28.4	46.9	29.1	45.4	29.4
26	49.0	28.6	46.5	29.1	45.1	29.3
27	49.0	28.6	46.6	29.1	44.4	28.6
28	48.9	28.9	46.1	28.9	44.5	28.9
29	48.3	28.8	46.2	28.8	44.1	28.6
30	48.5	28.9	46.1	29.0	44.5	28.9
31	48.2	28.8	0.0	0.0	43.8	28.8

MEANS	50.6	28.2	47.2	28.7	44.5	29.1
OBSVNS.	31	31	30	30	31	31
YRLY. MEANS					51.1	26.8
MAXIMUM	54.0	28.9	48.7	29.1	46.5	29.7
MINIMUM	48.2	27.6	46.1	27.4	43.0	28.6
STD.DEV.	1.50	.39	.72	.39	1.02	.25

CHROME ISLAND

49 28 20 N

124 40 57 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.5	28.8	41.4	29.0	43.8	29.0
2	43.4	28.6	41.1	29.0	43.4	29.3
3	43.0	28.5	41.2	28.9	43.4	29.3
4	43.3	28.8	42.0	29.1	44.0	29.1
5	43.2	28.6	41.8	29.1	43.4	29.3
6	43.5	28.9	41.8	29.1	43.6	29.1
7	43.6	28.9	43.3	29.3	41.3	27.3
8	43.8	29.0	42.8	29.3	42.8	28.8
9	43.6	28.9	42.5	28.9	43.8	29.0
10	42.5	28.8	43.0	29.0	44.2	28.8
11	43.6	29.0	42.9	28.8	44.5	28.9
12	44.0	28.6	43.2	29.0	44.4	29.0
13	42.5	28.8	43.8	29.3	45.5	28.9
14	42.0	28.5	44.5	29.3	44.8	28.9
15	43.4	28.8	44.3	29.3	44.8	28.9
16	43.9	28.8	44.8	29.3	45.1	29.1
17	43.0	29.3	42.7	29.1	45.2	29.1
18	43.5	29.1	44.0	29.3	45.2	28.8
19	42.5	28.8	44.4	29.3	44.8	29.0
20	43.5	28.8	44.1	29.3	44.8	28.9
21	43.2	29.0	44.5	29.4	45.2	26.4
22	42.7	28.5	44.7	29.4	45.3	26.5
23	43.8	28.9	43.9	28.6	45.0	24.7
24	42.0	28.4	44.8	29.0	44.8	28.2
25	42.5	28.6	44.1	29.0	45.4	27.2
26	41.5	28.8	44.5	29.3	45.4	26.9
27	41.8	28.8	44.8	29.4	45.1	26.3
28	41.8	28.8	43.8	29.0	46.4	26.5
29	42.3	28.9	43.7	28.8	46.1	27.7
30	42.5	28.9	0.0	0.0	46.1	27.1
31	42.1	28.8	0.0	0.0	45.5	27.7
MEANS	43.0	28.8	43.4	29.1	44.6	28.2
OBSVNS.	31	31	29	29	31	31
MAXIMUM	44.0	29.3	44.8	29.4	46.4	29.3
MINIMUM	41.5	28.4	41.1	28.6	41.3	24.7
STD.DEV.	.72	.19	1.17	.21	1.07	1.20

CHROME ISLAND

49 28 20 N

124 40 57 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.0	28.2	46.2	28.5	52.9	28.1
2	45.0	28.8	46.3	28.5	55.6	25.0
3	45.1	28.8	48.0	28.5	58.4	23.8
4	46.0	28.0	48.5	25.4	58.6	24.3
5	45.5	28.2	50.0	25.5	58.0	25.0
6	44.9	29.1	50.5	25.1	59.0	25.1
7	44.8	29.1	51.0	27.7	59.6	25.5
8	45.1	29.0	52.0	27.8	62.5	24.0
9	45.1	28.9	52.4	28.9	62.2	24.8
10	45.5	28.9	50.9	28.5	53.1	27.6
11	45.1	28.8	50.1	28.9	53.9	27.7
12	45.4	28.9	50.0	29.3	56.0	26.8
13	45.5	29.3	50.0	29.1	58.2	25.2
14	45.5	28.5	52.6	27.8	58.3	24.6
15	45.6	28.0	51.8	28.4	56.8	25.1
16	45.1	27.7	50.5	28.4	56.3	25.0
17	44.9	27.1	50.0	24.0	55.5	27.1
18	45.1	26.9	50.4	26.7	56.2	25.8
19	46.0	27.3	52.5	24.3	60.0	22.7
20	45.4	28.6	54.2	26.5	61.4	20.6
21	46.0	27.6	54.4	27.2	60.6	21.6
22	46.9	27.3	55.5	26.0	60.6	21.7
23	46.4	27.7	56.9	25.2	60.6	23.0
24	46.5	28.6	56.0	27.3	61.4	22.2
25	47.2	28.6	56.2	28.0	60.4	23.5
26	45.7	28.8	56.4	28.0	57.9	24.6
27	47.5	28.4	58.6	26.7	57.0	24.3
28	47.0	28.8	60.0	26.9	55.5	26.1
29	47.8	28.9	52.5	28.1	54.0	26.1
30	47.0	27.7	53.0	28.4	56.8	22.7
31	0.0	0.0	49.9	28.8	0.0	0.0
MEANS	45.8	28.3	52.2	27.4	57.9	24.7
OBSVNS.	30	30	31	31	30	30
MAXIMUM	47.8	29.3	60.0	29.3	62.5	28.1
MINIMUM	44.8	26.9	46.2	24.0	52.9	20.6
STD.DEV.	.86	.67	3.35	1.48	2.69	1.87

CHROME ISLAND

49 28 20 N

124 40 57 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	57.9	21.2	63.7	24.3	64.5	25.6
2	58.7	21.0	64.4	24.3	64.5	25.8
3	59.7	21.7	67.2	24.4	66.4	25.9
4	63.5	21.6	65.5	23.7	63.2	26.3
5	65.3	21.8	69.7	23.9	60.5	26.4
6	64.5	22.7	68.4	24.0	61.5	26.7
7	61.0	24.2	70.8	24.2	59.2	26.7
8	58.2	24.8	63.7	25.4	57.1	27.2
9	56.5	25.2	66.2	24.7	56.6	27.3
10	55.4	26.3	67.2	24.7	58.0	27.4
11	53.7	27.2	66.0	25.1	56.3	27.3
12	53.2	27.1	64.8	25.1	56.6	27.8
13	53.4	27.2	64.7	25.4	57.9	26.9
14	53.5	26.8	63.6	25.4	58.0	27.2
15	57.8	23.5	65.2	25.4	57.5	27.4
16	59.8	24.3	63.5	25.2	60.0	26.9
17	61.0	21.8	62.8	25.5	59.8	26.9
18	63.0	21.6	63.0	25.6	55.1	27.1
19	63.4	22.5	64.0	25.6	55.2	27.3
20	65.5	22.4	63.2	25.9	51.4	27.7
21	65.8	22.4	63.3	25.5	50.3	28.6
22	61.0	24.3	62.7	26.5	50.0	28.8
23	61.0	24.3	65.8	24.4	51.0	28.2
24	60.8	25.0	64.8	25.0	50.5	28.6
25	60.1	25.2	66.8	25.0	51.0	28.5
26	61.7	25.8	66.8	25.4	51.2	28.2
27	61.7	25.6	67.7	24.7	50.9	28.0
28	60.8	26.1	66.9	24.8	51.0	28.5
29	56.0	25.9	64.0	25.4	51.0	28.4
30	63.2	24.0	63.0	25.4	52.0	28.1
31	63.2	24.3	63.5	25.5	0.0	0.0
MEANS	60.0	24.1	65.3	25.0	56.3	27.4
OBSVNS.	31	31	31	31	30	30
MAXIMUM	65.8	27.2	70.8	26.5	66.4	28.8
MINIMUM	53.2	21.0	62.7	23.7	50.0	25.6
STD.DEV.	3.71	1.95	2.10	.64	4.90	.89

CHROME ISLAND

49 28 20 N 124 40 57 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.8	28.2	48.0	29.3	47.1	29.4
2	52.3	28.5	48.0	29.3	46.0	28.9
3	52.2	28.4	48.1	29.5	45.2	29.0
4	52.5	28.1	48.1	29.8	44.4	28.4
5	52.2	28.2	47.7	29.4	45.0	29.3
6	52.8	28.2	47.8	29.4	45.0	29.3
7	53.0	28.1	47.7	29.7	43.7	29.1
8	52.7	28.1	47.6	29.7	43.5	29.4
9	51.9	28.4	47.5	29.3	43.2	29.3
10	51.1	28.5	47.5	29.5	44.0	29.3
11	50.4	28.4	47.2	29.5	43.8	29.7
12	50.3	28.1	47.2	29.0	44.5	29.3
13	51.0	27.8	47.3	28.5	43.7	29.3
14	50.5	28.2	47.1	28.4	43.5	29.4
15	51.0	28.2	46.8	28.2	43.7	29.3
16	50.9	28.2	46.5	28.1	45.2	29.7
17	51.0	28.4	46.5	28.2	46.0	29.5
18	50.9	28.2	46.5	28.6	45.5	29.5
19	50.7	28.1	47.0	28.6	45.8	28.9
20	50.5	28.2	46.9	28.9	46.2	29.5
21	50.5	28.5	47.0	28.9	46.5	29.5
22	49.9	28.8	47.2	28.9	45.8	29.0
23	49.5	29.0	47.2	29.3	45.8	29.1
24	49.1	29.1	47.0	29.3	45.2	29.3
25	49.0	29.3	47.2	29.5	45.7	29.7
26	48.7	29.3	46.9	29.4	45.7	28.1
27	48.5	29.5	46.2	29.0	44.7	25.4
28	48.4	29.0	46.6	29.5	44.8	25.4
29	48.5	29.3	45.5	29.1	43.5	26.7
30	48.2	29.4	46.0	29.3	45.5	29.3
31	48.0	29.1	0.0	0.0	44.2	28.5
MEANS	50.6	28.5	47.1	29.1	44.9	28.9
OBSVNS.	31	31	30	30	31	31
YRLY. MEANS.....					50.9	27.5
MAXIMUM	53.0	29.5	48.1	29.8	47.1	29.7
MINIMUM	48.0	27.8	45.5	28.1	43.2	25.4
STD.DEV.	1.50	.48	.63	.48	1.04	1.10

ENTRANCE ISLAND

49 12 34 N

123 48 27 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	53.7	27.8	41.7	28.8	43.0	28.5
2	53.8	28.1	42.1	28.6	43.4	28.0
3	41.9	28.4	41.9	28.4	43.3	26.9
4	43.1	28.8	40.4	28.0	43.7	28.9
5	44.3	28.6	40.0	28.1	43.9	28.1
6	* 44.3	28.4	42.4	29.0	43.4	28.4
7	44.3	28.5	42.1	29.3	42.2	26.1
8	43.0	28.6	42.2	29.0	43.0	27.8
9	43.2	28.5	41.6	28.4	43.1	27.2
10	42.3	28.5	41.4	28.0	43.8	28.1
11	43.3	28.6	44.0	29.1	44.4	28.5
12	42.7	28.6	44.3	29.1	44.5	28.9
13	42.8	28.8	45.0	29.4	45.0	26.7
14	42.9	28.8	44.3	29.1	44.9	28.5
15	43.3	28.9	44.6	29.3	45.0	29.1
16	43.5	29.0	43.0	28.5	45.5	29.1
17	43.4	28.6	43.3	28.8	45.2	28.9
18	42.0	28.2	* 43.7	* 28.8	45.6	27.2
19	44.1	28.8	44.1	28.8	45.0	28.9
20	44.6	29.0	44.1	28.9	45.5	27.1
21	44.6	29.0	43.7	28.9	45.0	25.0
22	43.8	27.4	42.5	27.2	45.6	26.3
23	43.3	28.6	42.8	27.8	45.3	23.3
24	41.0	28.0	42.1	25.9	44.8	28.9
25	42.2	28.4	42.9	27.8	45.3	25.1
26	42.4	28.6	44.2	28.8	44.8	25.9
27	* 42.2	* 28.4	44.4	28.8	45.0	24.4
28	42.0	28.2	43.6	28.4	45.8	24.6
29	42.0	28.6	43.1	28.1	47.0	24.2
30	43.0	28.8	0.0	0.0	46.4	25.6
31	43.0	28.6	0.0	0.0	45.6	27.7

MEANS	43.8	28.5	42.9	28.5	44.6	27.2
OBSVNS.	29	30	28	28	31	31

MAXIMUM	53.8	29.0	45.0	29.4	47.0	29.1
MINIMUM	41.0	27.4	40.0	25.9	42.2	23.3

STD.DEV.	2.89	.36	1.28	.74	1.11	1.69
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ENTRANCE ISLAND

49 12 34 N

123 48 27 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.5	28.6	47.6	26.5	53.2	22.4
2	44.4	26.1	49.9	27.3	56.4	20.5
3	45.0	26.9	52.6	26.3	59.5	17.4
4	46.1	26.1	51.0	25.5	58.8	19.0
5	45.4	27.6	51.1	25.8	58.5	21.3
6	45.0	27.6	51.4	25.6	59.8	21.0
7	44.0	26.9	52.6	27.2	63.0	19.2
8	45.1	29.1	52.0	25.9	62.5	20.6
9	44.9	28.6	51.2	26.0	61.3	21.6
10	44.7	28.8	51.2	26.8	58.7	21.8
11	43.9	28.1	51.5	27.6	59.9	22.1
12	45.0	29.3	48.6	27.6	61.3	21.4
13	44.3	28.8	51.5	27.6	58.3	22.9
14	45.0	27.3	54.5	26.1	59.9	21.3
15	44.5	27.6	52.0	26.9	56.0	23.8
16	44.6	26.0	54.5	27.2	57.5	22.9
17	44.9	25.4	55.0	26.9	58.6	13.5
18	45.3	25.2	* 55.0	* 25.4	59.0	16.5
19	45.8	25.4	54.9	23.9	60.3	15.3
20	45.5	27.1	54.8	23.8	60.2	17.3
21	45.9	26.9	56.3	24.7	60.8	20.4
22	46.6	27.1	54.1	26.7	59.6	20.4
23	46.3	26.9	54.4	26.1	59.5	19.7
24	46.0	27.2	55.8	26.0	59.0	22.1
25	45.6	27.6	56.0	26.0	60.1	19.7
26	46.5	27.3	57.6	25.5	56.5	24.0
27	46.5	27.1	61.6	20.0	53.1	26.5
28	47.3	26.8	64.7	16.7	* 52.9	* 26.6
29	47.4	26.9	56.6	24.8	52.7	26.8
30	48.0	25.8	57.8	25.2	58.7	17.1
31	0.0	0.0	52.5	27.4	0.0	0.0
MEANS	45.5	27.2	53.8	25.7	58.7	20.6
OBSVNS.	30	30	30	30	29	29
MAXIMUM	48.0	29.3	64.7	27.6	63.0	26.8
MINIMUM	43.9	25.2	47.6	16.7	52.7	13.5
STD.DEV.	1.03	1.11	3.59	2.27	2.54	3.00

ENTRANCE ISLAND

49 12 34 N

123 48 27 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	59.0	17.3	63.4	22.6	62.3	25.6
2	59.5	20.6	63.5	23.7	63.2	26.3
3	60.3	19.6	66.1	23.7	61.5	26.1
4	62.5	21.0	68.9	23.5	64.2	27.1
5	65.5	20.5	67.5	23.3	61.8	26.3
6	60.2	22.4	68.1	21.2	60.3	26.1
7	* 56.4	* 24.8	68.3	21.4	60.4	25.9
8	52.6	27.1	68.3	22.4	53.7	27.4
9	52.5	27.3	67.5	23.1	54.5	27.8
10	52.4	27.2	66.5	23.7	56.5	26.9
11	51.5	27.2	66.6	23.8	58.5	26.1
12	51.1	27.4	66.0	24.0	60.0	25.8
13	53.6	26.3	65.5	23.9	59.4	25.6
14	57.9	21.2	64.6	23.7	59.3	25.6
15	59.1	19.2	64.6	23.1	59.1	25.9
16	59.5	19.6	62.9	23.5	59.4	25.9
17	60.5	21.0	63.4	24.0	58.6	26.1
18	60.3	22.5	62.4	25.2	57.3	26.1
19	62.6	22.2	64.4	21.0	55.7	26.7
20	63.2	22.6	66.0	22.2	* 52.6	* 27.6
21	64.0	22.9	62.2	24.7	49.5	28.4
22	58.6	24.8	67.2	21.4	49.2	28.6
23	60.0	25.1	63.1	24.7	51.0	27.8
24	58.5	25.5	68.1	22.2	51.5	27.6
25	55.3	26.4	63.5	21.8	51.6	28.0
26	61.8	25.6	67.4	21.4	52.5	26.3
27	59.8	25.5	66.2	23.0	52.0	24.4
28	61.9	25.0	67.0	24.0	52.2	25.1
29	64.1	18.6	64.8	24.0	52.2	24.4
30	65.0	19.7	62.4	25.0	53.6	24.2
31	63.8	20.0	62.5	25.6	0.0	0.0
MEANS	59.2	23.0	65.4	23.3	56.6	26.3
OBSVNS.	30	30	31	31	29	29
MAXIMUM	65.5	27.4	68.9	25.6	64.2	28.6
MINIMUM	51.1	17.3	62.2	21.0	49.2	24.2
STD.DEV.	4.19	3.09	2.10	1.23	4.43	1.14

ENTRANCE ISLAND

49 12 34 N

123 48 27 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	54.0	24.0	48.0	29.1	47.0	28.8
2	53.5	25.6	48.3	29.0	46.0	28.6
3	52.5	26.7	48.5	29.3	45.3	28.5
4	52.2	27.1	48.3	29.3	44.3	28.2
5	52.0	27.2	48.1	29.3	44.2	28.8
6	53.3	27.2	48.0	29.3	44.4	28.5
7	52.2	27.1	48.2	29.5	42.2	27.3
8	53.5	26.5	48.2	28.9	39.9	27.7
9	51.8	27.3	48.0	29.3	44.0	28.5
10	51.2	27.3	47.7	29.4	44.4	28.5
11	51.2	27.3	47.3	28.0	44.9	28.9
12	50.8	27.6	47.2	28.4	41.5	27.8
13	51.1	27.6	47.0	26.7	44.3	29.0
14	51.2	27.6	47.5	26.9	43.8	28.6
15	51.8	27.2	46.3	25.5	45.1	29.1
16	51.3	27.7	46.4	25.8	46.6	29.4
17	51.5	27.4	45.6	25.8	47.2	29.5
18	50.7	27.7	44.4	25.5	44.8	28.8
19	50.8	27.8	46.5	27.1	47.1	29.7
20	50.1	28.0	46.2	27.1	47.1	29.7
21	49.7	28.4	47.1	28.5	46.8	29.7
22	50.0	28.6	47.4	29.1	46.0	28.0
23	49.8	28.5	47.6	29.1	45.9	28.9
24	49.8	28.1	45.5	27.2	45.5	28.9
25	48.3	28.9	47.2	29.0	46.3	29.5
26	48.4	28.5	45.6	27.4	45.4	25.0
27	48.9	28.4	45.8	27.6	44.3	22.0
28	48.5	28.5	46.6	28.4	44.5	28.4
29	48.7	28.1	45.2	27.4	42.5	25.5
30	47.7	28.6	46.6	28.5	44.9	28.9
31	48.6	28.8	0.0	0.0	44.0	28.0

MEANS	50.8	27.6	47.0	28.0	44.8	28.3
OBSVNS.	31	31	30	30	31	31
YRLY. MEANS.....					51.1	26.2
MAXIMUM	54.0	28.9	48.5	29.5	47.2	29.7
MINIMUM	47.7	24.0	44.4	25.5	39.9	22.0
STD.DEV.	1.70	1.00	1.08	1.29	1.70	1.57

DEPARTURE BAY

49 12 38 N

123 57 17 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.0	27.2	* 42.0	28.0	41.0	20.6
2	45.5	28.5	41.0	28.0	42.0	28.8
3	40.5	28.0	40.5	28.1	42.0	26.7
4	41.0	28.1	42.5	28.5	43.0	28.8
5	41.0	27.3	42.5	29.7	42.2	25.1
6	41.0	28.1	42.2	27.6	42.0	27.6
7	42.5	28.0	43.0	29.0	40.0	26.5
8	43.0	28.6	43.0	27.7	43.0	27.3
9	44.5	28.2	43.0	28.4	43.0	21.6
10	43.0	28.6	43.0	26.0	44.0	19.1
11	42.5	29.0	45.5	28.5	45.5	18.6
12	43.5	28.8	44.0	25.8	46.0	24.0
13	43.0	28.2	45.5	26.7	46.0	26.7
14	43.0	27.7	43.0	26.7	46.0	20.1
15	42.0	27.2	42.0	26.3	45.5	20.1
16	42.0	27.4	46.0	29.0	44.0	21.2
17	41.5	26.8	43.0	28.6	46.0	20.9
18	41.5	27.6	42.5	20.0	46.0	20.9
19	40.5	27.8	44.0	27.6	46.0	23.3
20	42.0	27.6	44.0	26.8	44.5	22.2
21	43.0	28.6	43.0	24.6	44.0	25.0
22	42.5	26.3	43.0	26.1	44.5	24.3
23	43.0	29.1	43.5	19.1	45.5	22.4
24	41.0	28.9	43.5	26.1	44.0	23.0
25	* 40.5	27.8	45.0	27.2	46.5	27.3
26	40.0	27.4	43.5	26.0	46.0	24.8
27	41.5	28.1	44.0	25.2	46.5	25.4
28	41.5	27.4	43.0	24.2	46.5	25.6
29	42.5	27.6	44.0	28.5	44.0	24.6
30	41.0	26.4	0.0	0.0	45.0	24.3
31	43.0	28.2	0.0	0.0	46.0	24.7
MEANS	42.2	27.9	43.3	26.7	44.4	23.9
OBSVNS.	30	31	28	29	31	31
MAXIMUM	45.5	29.1	46.0	29.7	46.5	28.8
MINIMUM	40.0	26.3	40.5	19.1	40.0	18.6
STD.DEV.	1.32	.71	1.24	2.41	1.80	2.86

DEPARTURE BAY

49 12 38 N

123 57 17 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.6	28.8	48.0	24.8	57.0	26.1
2	45.2	26.9	47.1	26.1	60.0	19.6
3	45.5	26.4	49.0	26.4	62.0	18.0
4	46.5	25.6	52.0	25.6	60.0	18.7
5	46.5	25.0	52.0	25.6	60.5	22.0
6	44.5	25.5	56.0	25.8	68.0	23.8
7	43.0	22.7	54.0	25.2	62.5	21.2
8	46.5	23.8	51.5	25.5	64.5	19.9
9	44.0	26.0	54.0	24.6	62.5	20.5
10	44.0	26.1	56.0	25.1	59.0	21.3
11	44.0	26.9	53.0	25.4	60.0	21.2
12	44.5	26.7	55.0	26.9	58.5	23.4
13	45.5	27.6	55.0	25.4	60.0	20.4
14	45.0	24.3	55.0	26.5	58.5	24.7
15	45.0	26.4	55.0	26.1	56.5	25.4
16	45.0	26.1	53.0	25.8	58.0	22.2
17	45.0	25.1	54.0	25.5	58.0	14.6
18	46.0	25.6	53.5	23.9	61.0	16.6
19	46.5	25.5	55.5	23.3	64.0	16.3
20	46.0	24.8	55.8	24.6	61.0	15.8
21	46.5	27.1	56.0	24.3	62.0	18.7
22	46.5	26.9	55.0	28.5	60.5	20.6
23	46.5	26.1	* 56.4	* 28.4	60.0	20.1
24	48.0	26.4	57.7	28.4	59.0	18.3
25	47.0	27.7	57.5	27.7	59.0	23.0
26	48.0	26.7	59.0	27.2	57.5	23.0
27	47.0	25.5	63.0	22.5	57.5	25.1
28	47.5	27.1	66.5	19.6	56.0	25.1
29	48.2	25.6	63.5	17.3	55.5	* 21.8
30	48.5	24.7	63.5	26.5	58.5	18.6
31	0.0	0.0	57.5	26.4	0.0	0.0

MEANS	45.9	26.0	55.5	25.2	59.9	20.8
OBSVNS.	30	30	30	30	30	29

MAXIMUM	48.5	28.8	66.5	28.5	68.0	26.1
MINIMUM	43.0	22.7	47.1	17.3	55.5	14.6

STD.DEV.	1.39	1.24	4.41	2.29	2.70	3.06
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DEPARTURE BAY

49 12 38 N

123 57 17 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	59.0	21.7	67.0	23.3	63.5	25.0
2	60.5	21.8	67.5	23.3	63.0	26.5
3	62.5	20.4	65.0	24.4	63.0	25.9
4	65.5	20.4	65.5	22.9	63.0	25.8
5	66.5	22.1	68.0	23.0	63.0	26.7
6	67.0	20.8	69.0	22.4	61.5	24.8
7	60.5	23.0	72.0	21.7	60.0	26.1
8	64.0	22.5	69.0	24.7	57.0	26.4
9	55.5	26.3	67.3	22.0	54.5	29.5
10	53.8	28.5	66.2	23.3	54.0	28.9
11	52.8	27.4	66.0	24.2	57.0	26.7
12	54.0	27.3	65.0	25.2	58.0	25.9
13	52.5	27.8	65.0	24.3	58.0	26.1
14	55.5	26.4	63.3	22.7	60.5	26.4
15	58.0	16.3	65.0	23.4	60.5	26.3
16	62.0	17.1	63.5	23.3	61.0	25.9
17	64.5	20.6	63.0	24.0	59.5	25.8
18	63.5	23.4	61.5	24.4	57.0	26.8
19	63.0	23.4	62.5	23.7	56.0	27.2
20	63.8	23.0	65.0	24.3	56.0	25.4
21	66.0	22.9	64.5	25.2	51.0	27.2
22	64.5	23.8	64.5	26.5	50.5	28.9
23	61.5	24.4	67.0	26.5	50.0	27.8
24	61.0	25.6	67.5	23.8	50.0	27.7
25	59.5	26.1	70.0	23.4	49.5	27.4
26	62.0	25.0	67.5	23.4	51.0	27.1
27	60.5	24.8	68.0	23.0	51.5	25.1
28	60.0	26.7	66.0	25.4	51.0	25.9
29	64.0	27.8	66.0	25.1	51.5	25.5
30	65.0	19.0	67.0	25.1	52.0	27.7
31	66.0	19.6	67.0	25.9	0.0	0.0
MEANS	61.1	23.4	66.2	24.0	56.5	26.6
OBSVNS.	31	31	31	31	30	30
MAXIMUM	67.0	28.5	72.0	26.5	63.5	29.5
MINIMUM	52.5	16.3	61.5	21.7	49.5	24.8
STD.DEV.	4.22	3.20	2.27	1.22	4.78	1.16

DEPARTURE BAY

49 12 38 N

123 57 17 W

OCTOBER

NOVEMBER

DECEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	53.5	25.9	47.5	28.4	45.0	27.8
2	* 53.2	* 27.0	47.0	28.1	45.0	27.3
3	53.0	28.0	49.0	28.8	45.0	26.9
4	54.0	28.4	47.0	28.5	44.0	27.7
5	54.5	28.1	47.0	28.8	42.0	28.4
6	54.5	28.1	47.0	28.2	42.0	29.5
7	56.0	28.8	47.0	27.3	42.0	29.0
8	53.0	28.4	47.0	27.8	43.0	29.0
9	53.0	27.3	47.0	25.5	43.0	29.8
10	50.5	28.2	47.0	25.5	44.0	29.3
11	50.0	26.9	47.0	28.0	44.0	31.2
12	50.5	28.4	47.0	27.6	43.0	29.0
13	52.5	27.6	46.0	25.9	43.0	29.0
14	51.0	27.4	46.0	25.8	43.0	29.8
15	52.0	27.6	46.0	24.8	44.0	27.7
16	53.0	26.5	46.0	25.8	44.0	27.1
17	53.0	28.1	46.0	26.3	45.0	25.2
18	53.0	27.8	46.0	25.6	46.0	23.0
19	52.0	27.8	46.0	26.3	* 45.8	* 20.0
20	52.0	27.2	46.0	27.4	45.5	17.0
21	50.5	28.2	46.0	26.8	45.5	23.1
22	48.5	28.4	45.5	27.4	45.5	26.7
23	49.0	28.2	47.0	28.8	45.0	21.2
24	49.0	30.3	46.0	29.3	45.0	26.1
25	49.0	29.3	46.5	29.4	44.8	20.4
26	47.8	29.1	47.0	29.3	44.0	16.3
27	49.0	28.5	47.0	29.3	43.5	15.8
28	48.5	29.0	46.0	29.3	48.0	25.8
29	48.5	28.9	45.0	28.4	47.5	26.0
30	48.0	28.2	45.0	27.8	41.5	19.0
31	48.0	28.2	0.0	0.0	43.0	25.2

MEANS	51.2	28.1	46.5	27.5	44.2	25.6
OBSVNS.	30	30	30	30	30	30
YRLY. MEANS					51.5	25.5
MAXIMUM	56.0	30.3	49.0	29.4	48.0	31.2
MINIMUM	47.8	25.9	45.0	24.8	41.5	15.8
STD.DEV.	2.33	.86	.80	1.39	1.54	4.25

ACTIVE PASS

48 52 26 N

123 17 23 W

JANUARY

FEBRUARY

MARCH

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.9	28.9	39.9	28.6	42.5	28.5
2	* 43.0	* 29.1	39.8	28.6	43.2	29.7
3	42.1	29.3	40.1	29.7	42.7	29.8
4	42.5	29.5	39.1	28.5	42.2	25.9
5	42.7	29.1	39.4	27.7	42.8	29.7
6	42.5	28.9	42.0	28.9	42.2	27.3
7	42.7	28.9	42.6	29.1	41.2	26.1
8	43.3	29.8	42.7	29.3	41.2	23.1
9	43.2	29.8	41.8	28.9	42.2	20.9
10	42.5	29.4	42.0	28.9	43.8	25.0
11	42.5	28.8	43.3	29.5	44.3	28.6
12	* 41.8	* 28.2	43.7	29.1	45.2	28.9
13	41.0	27.7	43.4	29.0	46.9	29.1
14	42.7	29.1	43.2	29.1	45.3	29.5
15	44.1	29.0	44.0	29.4	45.2	29.8
16	43.3	29.1	44.2	29.5	45.3	30.6
17	42.6	29.7	43.8	29.1	45.7	29.9
18	42.0	28.6	43.1	28.8	44.3	30.0
19	42.7	28.9	43.5	27.1	44.6	29.7
20	42.6	29.5	43.6	28.6	44.1	29.7
21	43.9	29.9	42.8	29.0	44.9	27.1
22	43.2	30.0	42.8	29.0	45.0	29.3
23	* 41.0	* 26.7	42.5	28.0	46.1	28.9
24	38.9	23.4	43.1	28.1	45.5	29.4
25	40.3	29.4	43.7	29.1	45.0	27.7
26	40.0	28.6	43.7	29.1	44.3	28.0
27	39.6	29.0	44.8	29.1	44.7	28.1
28	41.7	29.4	45.1	30.0	45.5	20.9
29	41.5	29.4	43.8	29.3	46.2	28.1
30	39.8	28.0	0.0	0.0	46.2	27.4
31	40.3	28.8	0.0	0.0	45.5	28.9
MEANS	42.1	28.9	42.7	28.9	44.3	27.9
OBSVNS.	28	28	29	29	31	31
MAXIMUM	44.1	30.0	45.1	30.0	46.9	30.6
MINIMUM	38.9	23.4	39.1	27.1	41.2	20.9
STD.DEV.	1.40	1.20	1.59	.60	1.54	2.49

ACTIVE PASS

48 52 26 N

123 17 23 W

APRIL

MAY

JUNE

1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.2	26.7	46.2	29.4	54.3	23.9
2	45.4	26.8	47.5	27.8	61.2	5.4
3	45.8	27.7	46.9	28.9	54.4	22.4
4	46.2	28.6	53.2	15.8	52.3	27.4
5	45.2	28.5	51.9	17.5	51.3	27.3
6	44.4	29.0	52.8	21.8	58.7	3.7
7	45.6	29.4	50.4	27.4	61.7	5.8
8	45.5	29.5	49.2	27.7	60.7	3.7
9	44.6	29.8	49.2	28.4	54.8	21.7
10	45.2	29.7	48.7	28.9	50.1	27.6
11	46.3	30.0	48.2	29.4	50.5	28.2
12	46.4	30.2	48.3	29.1	49.6	28.8
13	46.2	30.2	49.6	29.3	51.3	27.8
14	45.8	29.8	48.8	29.3	51.2	27.6
15	45.7	29.9	46.8	29.5	51.2	27.2
16	44.9	29.1	54.2	19.2	52.6	27.3
17	45.8	28.0	50.4	24.6	51.6	27.7
18	45.7	27.8	50.2	14.2	56.0	4.5
19	45.7	27.3	52.5	15.4	57.2	6.0
20	45.7	28.0	53.3	12.4	59.0	15.2
21	46.5	28.1	53.3	25.8	59.5	15.4
22	46.8	27.8	55.7	14.9	56.6	22.2
23	46.6	26.7	54.2	8.0	56.6	20.0
24	46.9	27.8	54.3	18.6	57.0	23.4
25	48.6	28.2	54.3	26.5	54.6	26.3
26	47.8	28.5	56.2	25.1	54.6	24.6
27	48.4	28.5	60.2	15.8	52.2	27.8
28	48.3	28.0	58.4	18.8	51.1	29.1
29	49.2	24.7	54.2	25.6	54.7	27.8
30	46.9	28.5	53.4	26.4	59.7	12.2
31	0.0	0.0	50.8	28.2	0.0	0.0
MEANS	46.2	28.4	51.7	23.2	54.9	20.6
OBSVNS.	30	30	31	31	30	30
MAXIMUM	49.2	30.2	60.2	29.5	61.7	29.1
MINIMUM	44.4	24.7	46.2	8.0	49.6	3.7
STD.DEV.	1.20	1.25	3.45	6.32	3.62	9.05

ACTIVE PASS

48 52 26 N

123 17 23 W

JULY

AUGUST

SEPTEMBER 1972

DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	58.2	23.8	60.8	22.6	60.6	17.4
2	58.0	18.7	57.5	25.6	62.4	18.0
3	60.3	18.4	59.2	26.0	61.4	25.2
4	62.0	14.8	57.5	26.9	59.3	27.3
5	58.9	23.7	67.0	12.9	56.5	29.4
6	56.4	26.4	69.8	11.0	54.3	27.4
7	53.1	27.7	69.0	14.1	52.8	28.8
8	51.8	28.9	69.2	16.1	51.7	29.3
9	51.5	28.8	64.8	22.7	52.1	28.8
10	51.0	29.0	64.9	22.2	58.8	18.4
11	50.5	28.9	61.5	23.8	57.1	23.3
12	50.3	29.0	64.5	19.6	57.6	23.8
13	51.3	29.4	57.3	26.5	57.0	25.8
14	63.4	10.8	63.5	16.1	57.2	24.8
15	60.1	13.3	59.3	25.8	59.2	23.4
16	60.7	20.1	60.4	25.8	56.3	26.7
17	59.7	16.5	56.8	26.4	57.8	25.2
18	61.3	21.3	57.0	27.7	56.7	26.5
19	62.0	20.5	63.8	17.0	53.4	28.1
20	62.5	4.5	56.5	26.7	50.8	28.2
21	62.2	25.1	58.2	27.3	50.0	28.8
22	59.8	26.3	57.2	28.1	49.5	30.0
23	58.8	26.3	52.1	29.0	49.8	29.8
24	56.4	26.5	52.0	29.1	51.7	28.6
25	53.0	28.4	52.5	28.8	51.6	27.2
26	56.4	29.0	67.6	13.3	50.5	27.2
27	56.6	26.7	66.3	18.0	50.2	28.1
28	54.5	27.6	67.6	17.6	48.8	28.6
29	67.0	12.8	63.0	19.1	50.0	29.4
30	64.7	19.0	60.8	23.0	51.3	25.4
31	65.0	* 20.8	59.7	23.9	0.0	0.0

MEANS	58.0	22.7	61.2	22.3	54.5	26.3
OBSVNS.	31	30	31	31	30	30
MAXIMUM	67.0	29.4	69.8	29.1	62.4	30.0
MINIMUM	50.3	4.5	52.0	11.0	48.8	17.4
STD.DEV.	4.73	6.59	5.08	5.41	4.05	3.41

ACTIVE PASS

48 52 26 N

123 17 23 W

OCTOBER

NOVEMBER

DECEMBER 1972

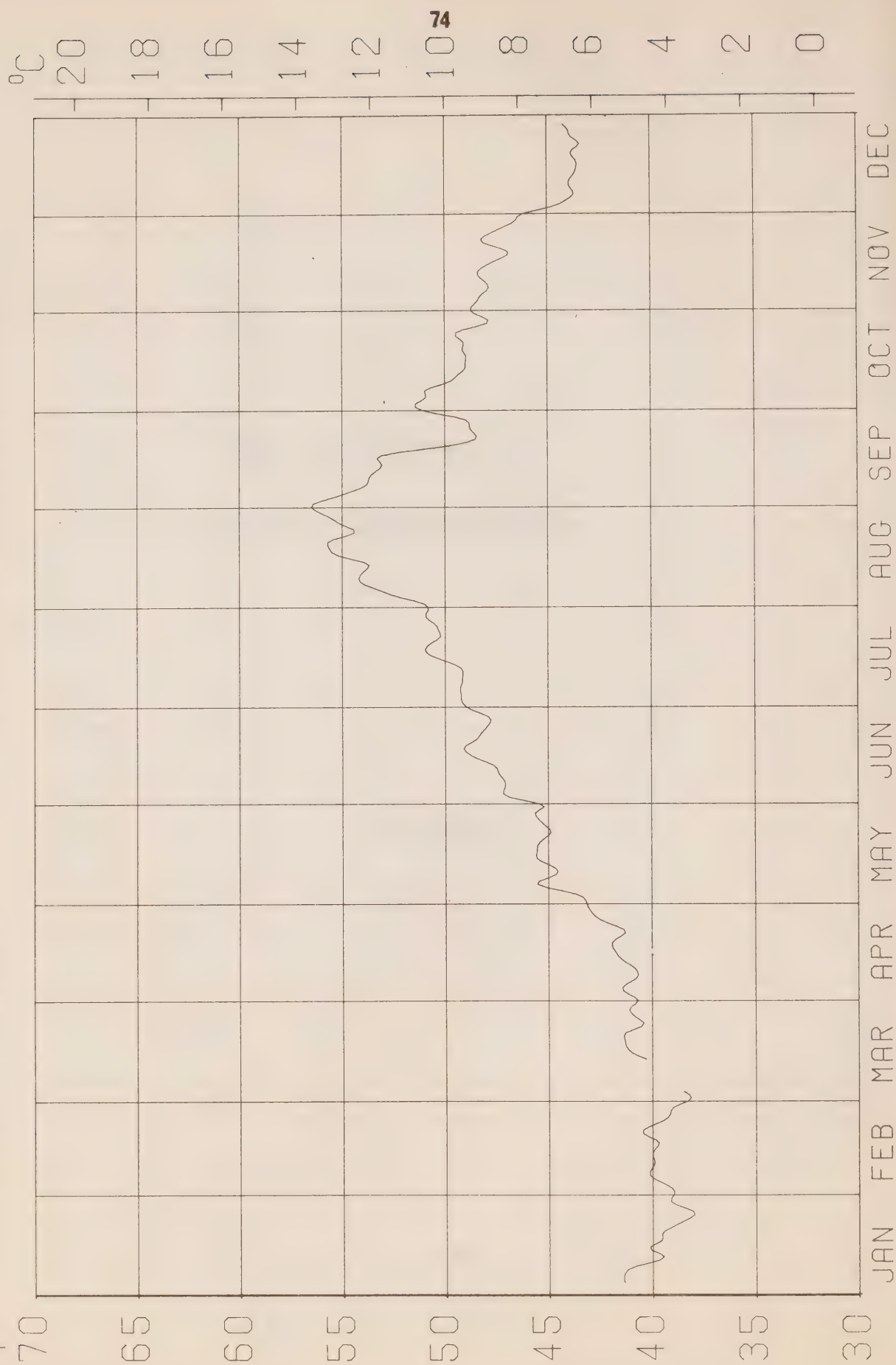
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1	50.3	27.8	48.2	29.1	47.2	30.2
2	51.6	27.6	49.1	29.5	45.2	28.2
3	52.7	24.7	49.0	29.9	43.7	29.1
4	51.8	27.8	49.3	30.0	44.2	30.2
5	51.8	27.8	48.4	29.8	43.6	29.8
6	51.3	28.9	48.6	30.0	43.8	29.1
7	51.7	28.5	48.7	30.4	42.3	28.1
8	51.2	28.1	48.2	30.4	43.0	31.2
9	50.2	28.9	47.8	30.7	42.2	29.8
10	50.2	25.6	47.5	30.8	42.4	29.1
11	49.3	26.8	47.0	30.2	42.0	29.0
12	49.4	26.4	47.1	29.1	41.2	28.9
13	50.0	27.2	46.8	26.1	42.2	29.1
14	50.2	27.6	46.2	24.8	42.3	28.5
15	50.7	28.5	46.2	25.5	42.7	29.5
16	50.8	27.7	45.5	25.0	45.2	29.8
17	50.6	28.4	46.5	27.6	45.9	29.5
18	50.2	28.0	46.2	27.4	45.2	29.4
19	50.1	28.0	46.7	28.2	46.7	30.0
20	50.0	28.5	46.2	27.6	46.6	30.2
21	50.3	28.4	46.9	28.2	46.2	29.8
22	50.6	28.9	46.8	28.1	45.8	28.4
23	* 49.4	* 29.3	47.2	29.7	46.1	29.8
24	48.3	29.7	46.2	29.7	45.2	30.7
25	48.8	29.7	46.5	29.4	46.2	29.8
26	48.4	29.1	45.6	27.7	46.3	29.5
27	48.2	29.1	45.1	27.3	45.8	29.9
28	48.0	29.0	45.8	28.4	42.6	21.4
29	47.5	28.4	45.5	28.0	42.5	25.4
30	47.8	28.2	46.3	28.9	45.2	29.0
31	48.2	28.8	0.0	0.0	43.5	24.7
MEANS	50.0	28.1	47.0	28.6	44.3	28.9
OBSVNS.	30	30	30	30	31	31
YRLY. MEANS.....					49.8	26.2
MAXIMUM	52.7	29.7	49.3	30.8	47.2	31.2
MINIMUM	47.5	24.7	45.1	24.8	41.2	21.4
STD.DEV.	1.36	1.10	1.19	1.66	1.76	1.91

Annual Graphs of the 7-day
normally-weighted, running means

Temperature
and
Salinity

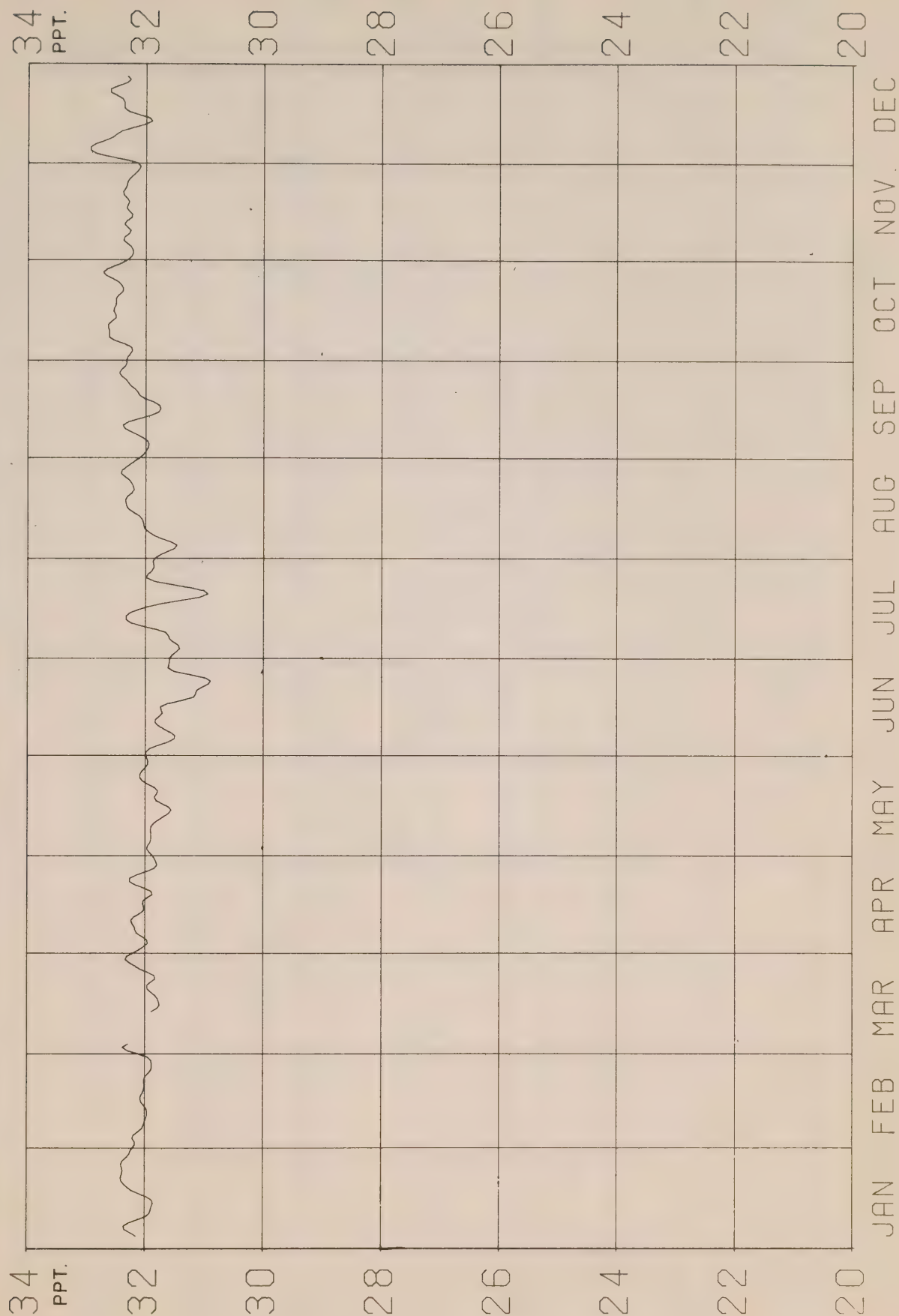
1972

LANGARA ISLAND 1972 TEMPERATURES

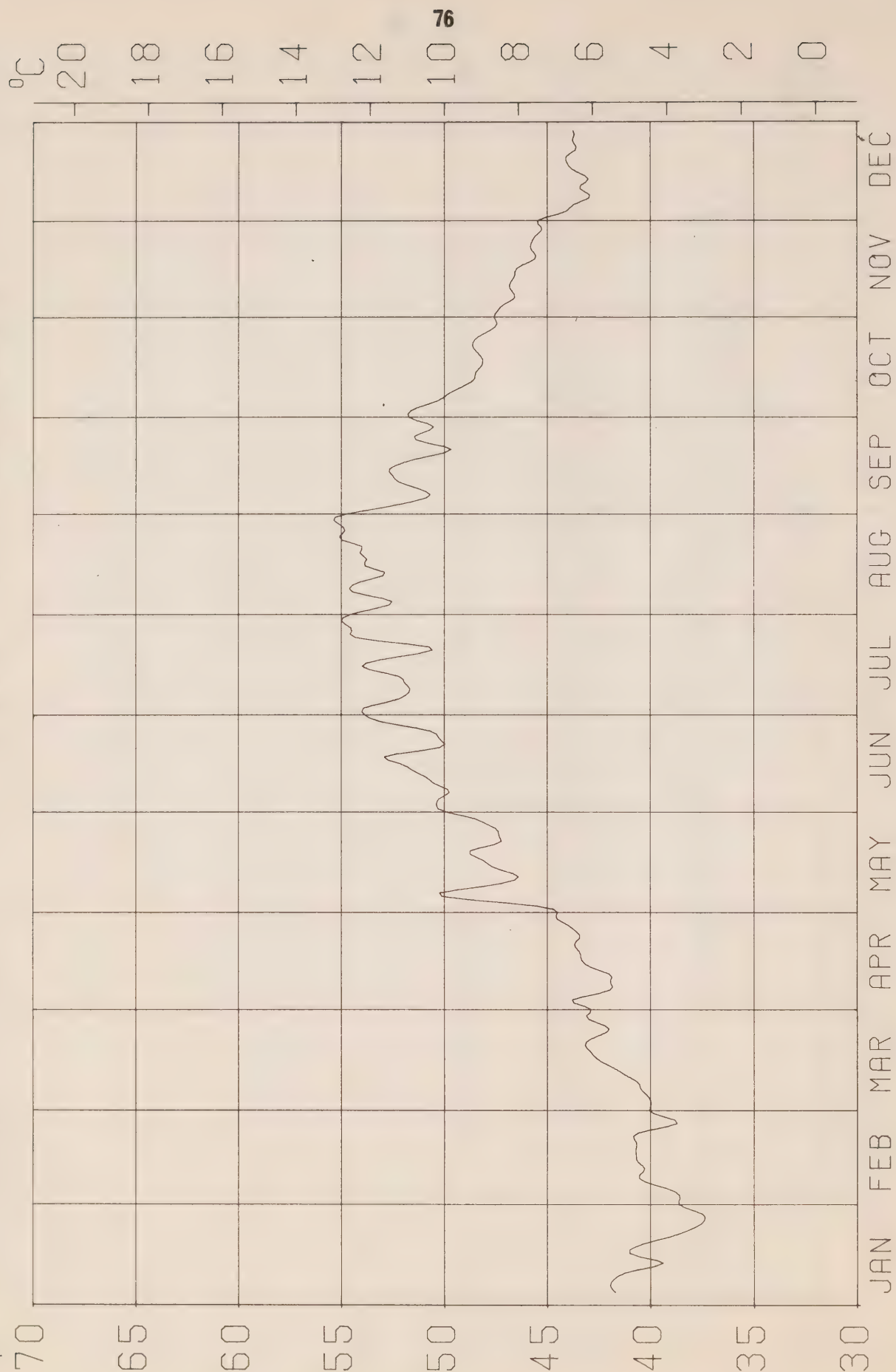


LANGARA ISLAND 1972 SALINITIES

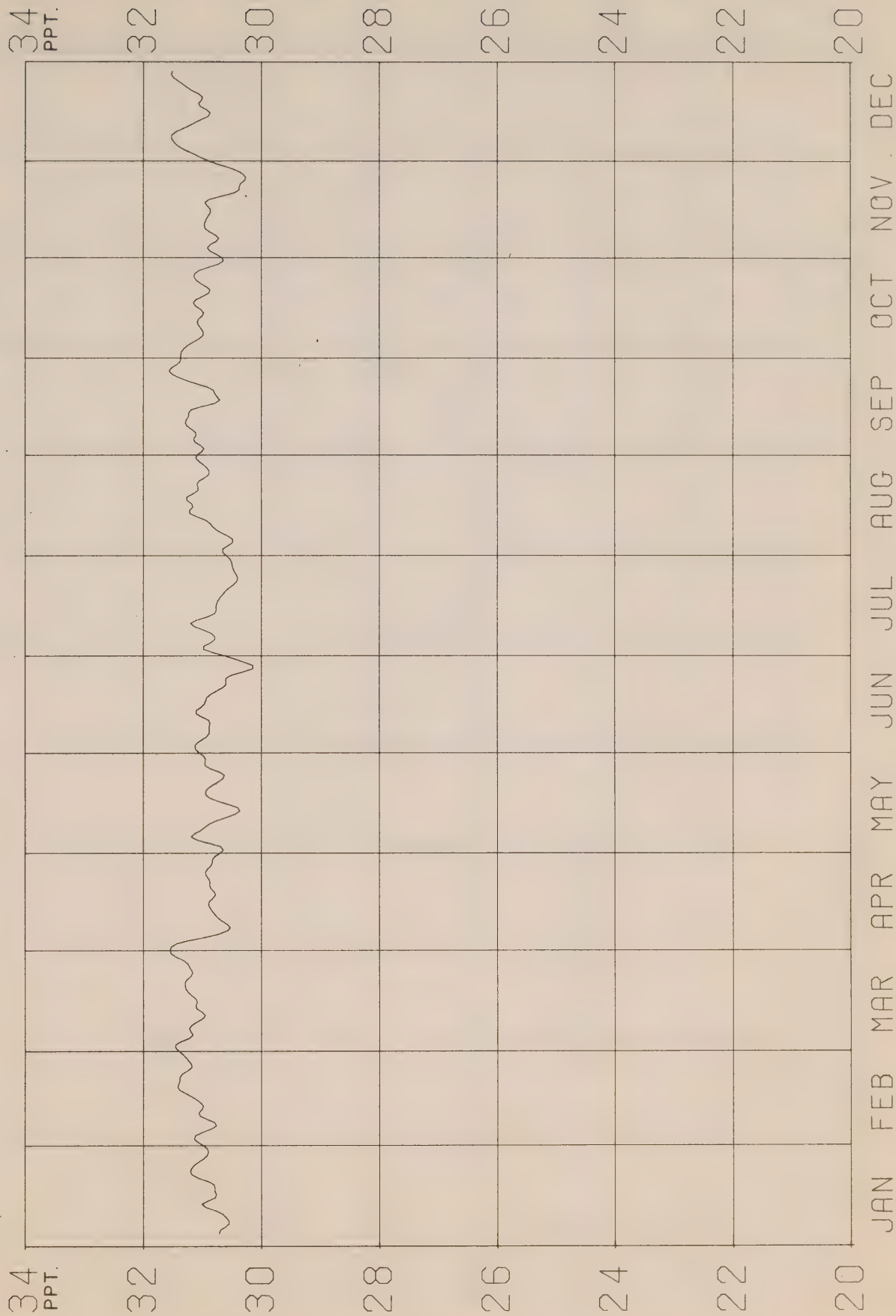
75



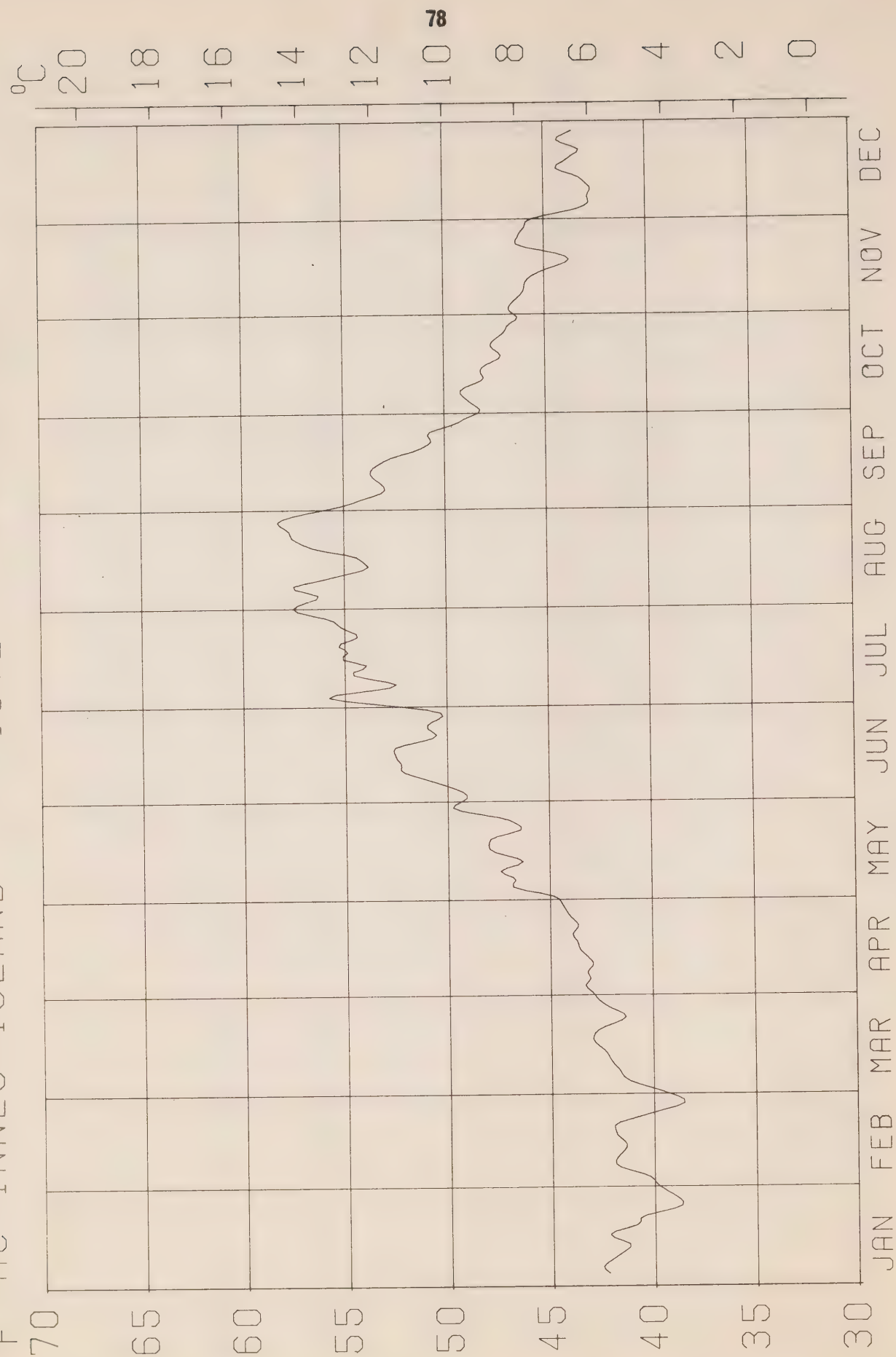
BONILLA ISLAND 1972 TEMPERATURES



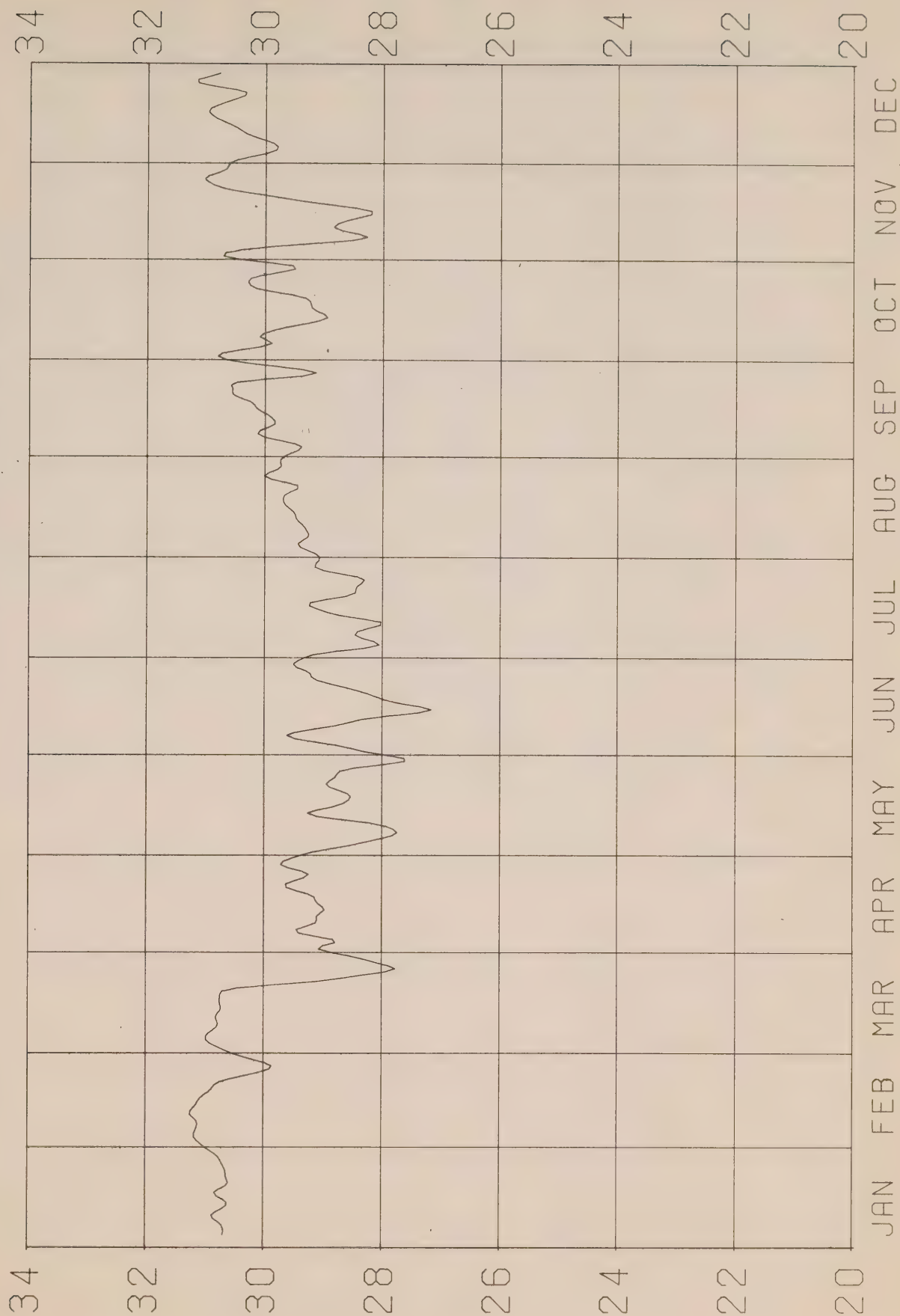
BONILLA ISLAND 1972 SALINITIES



MC INNES ISLAND 1972 TEMPERATURES

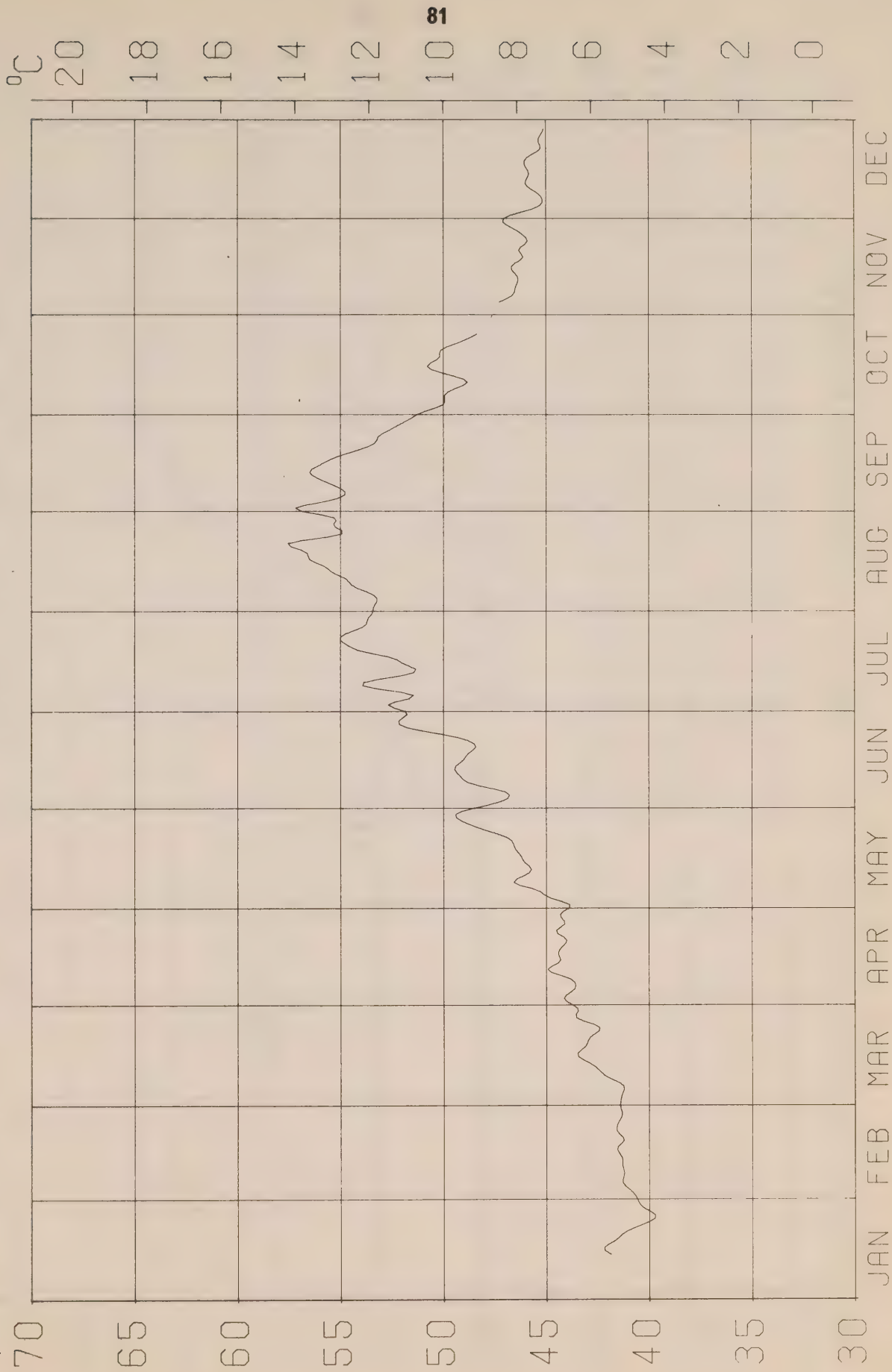


MC INNES ISLAND 1972 SALINITIES

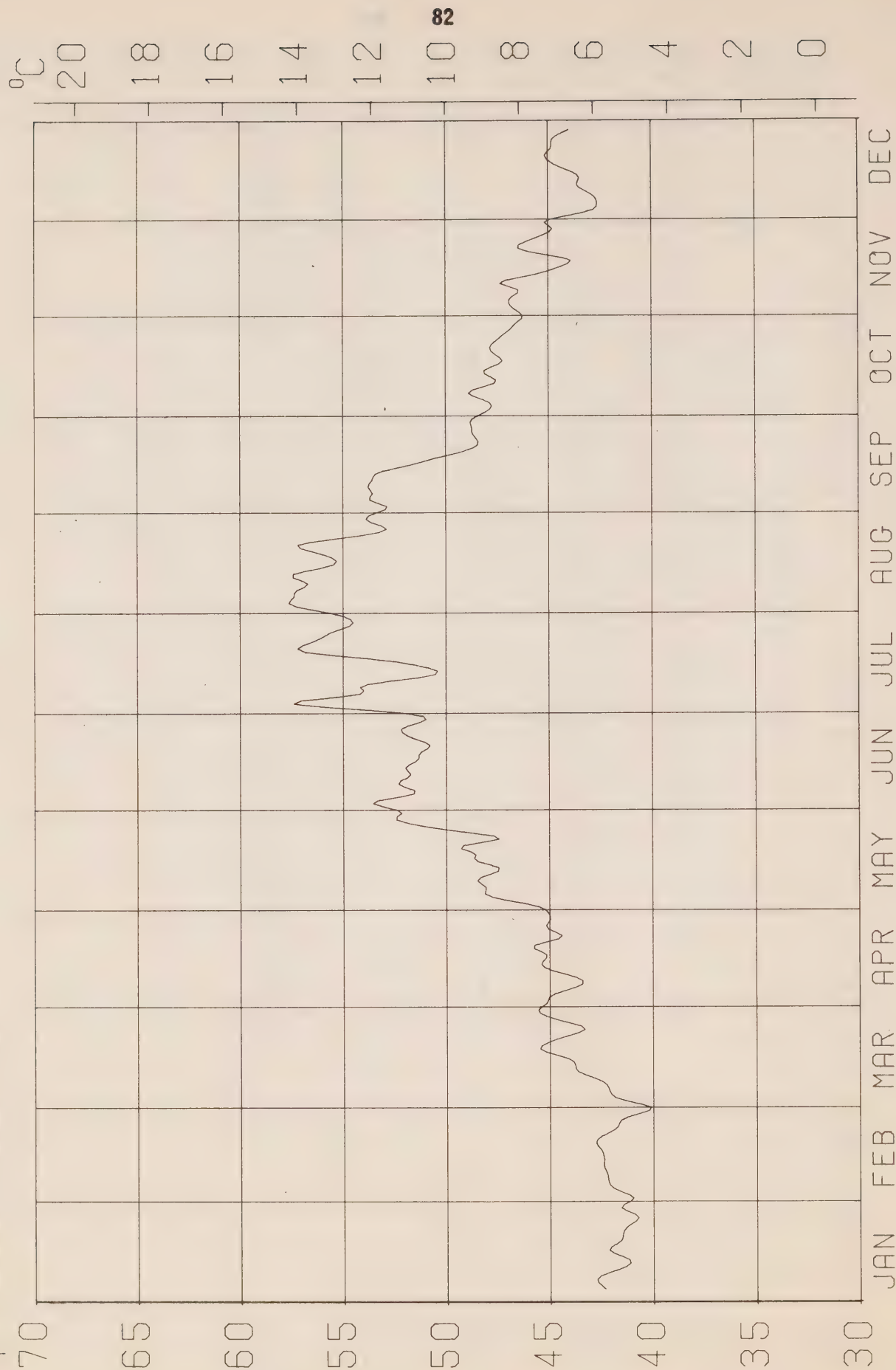


CAPE ST JAMES

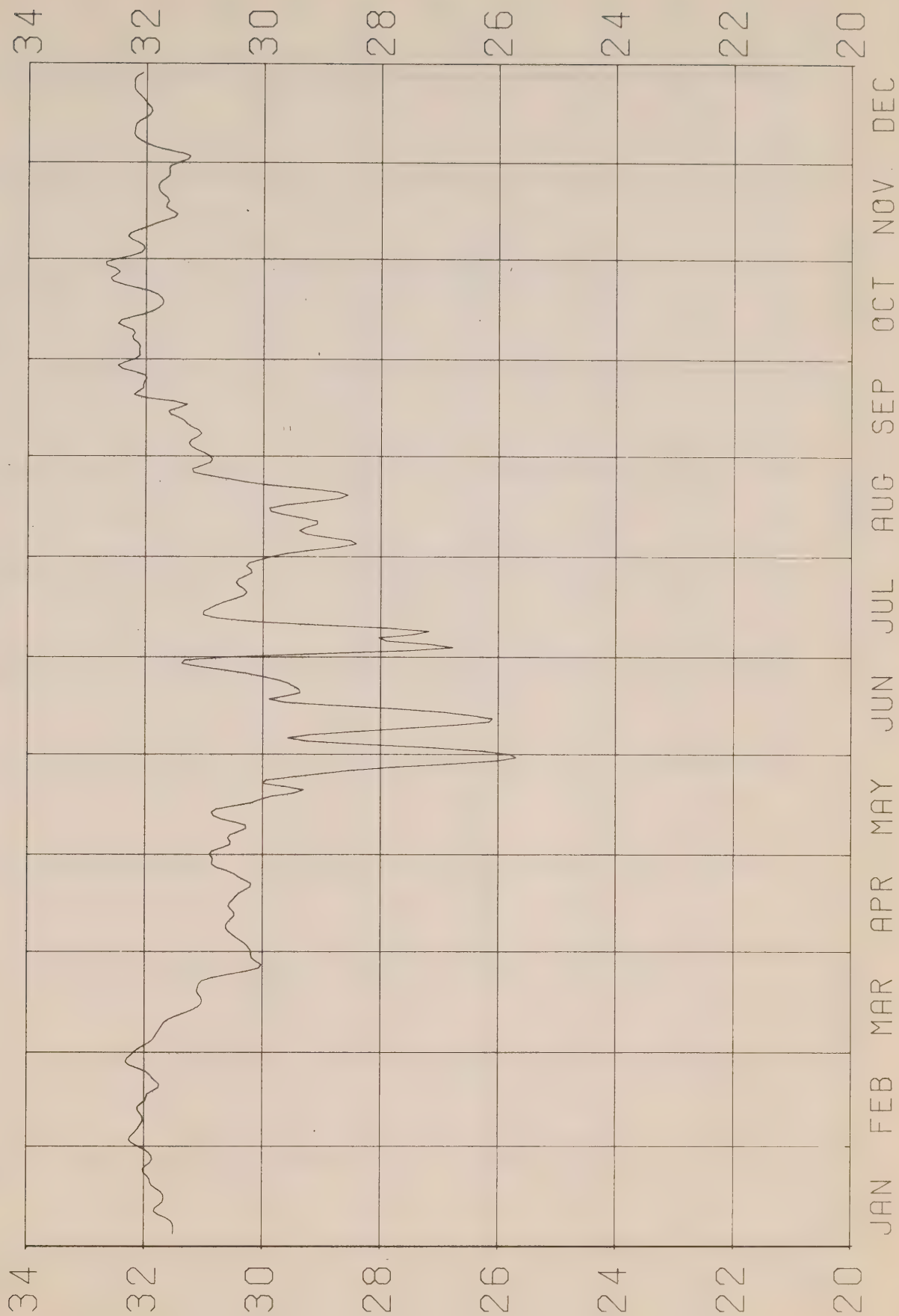
1972 TEMPERATURES



EGG ISLAND 1972 TEMPERATURES

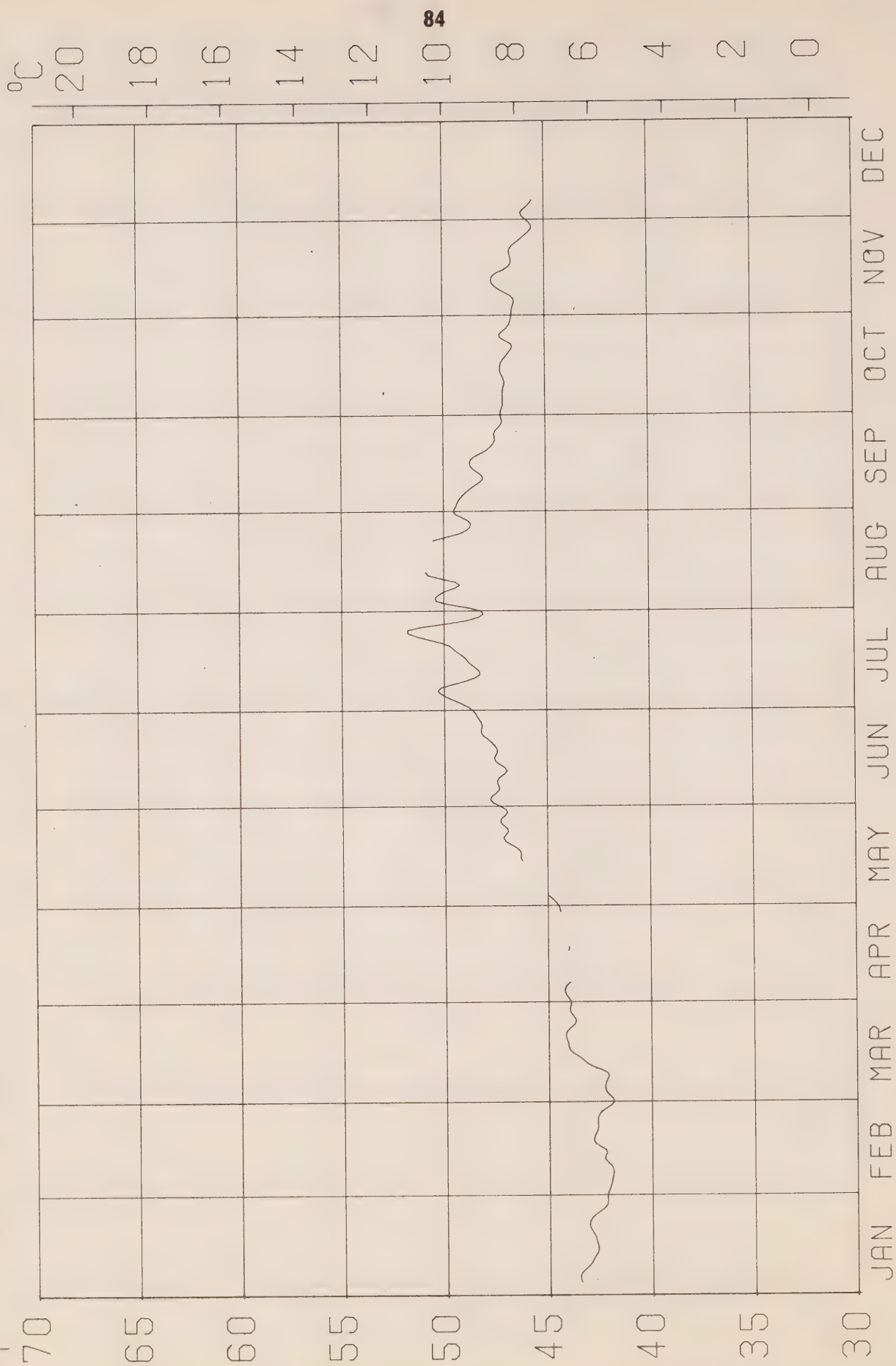


EGG ISLAND 1972 SALINITIES

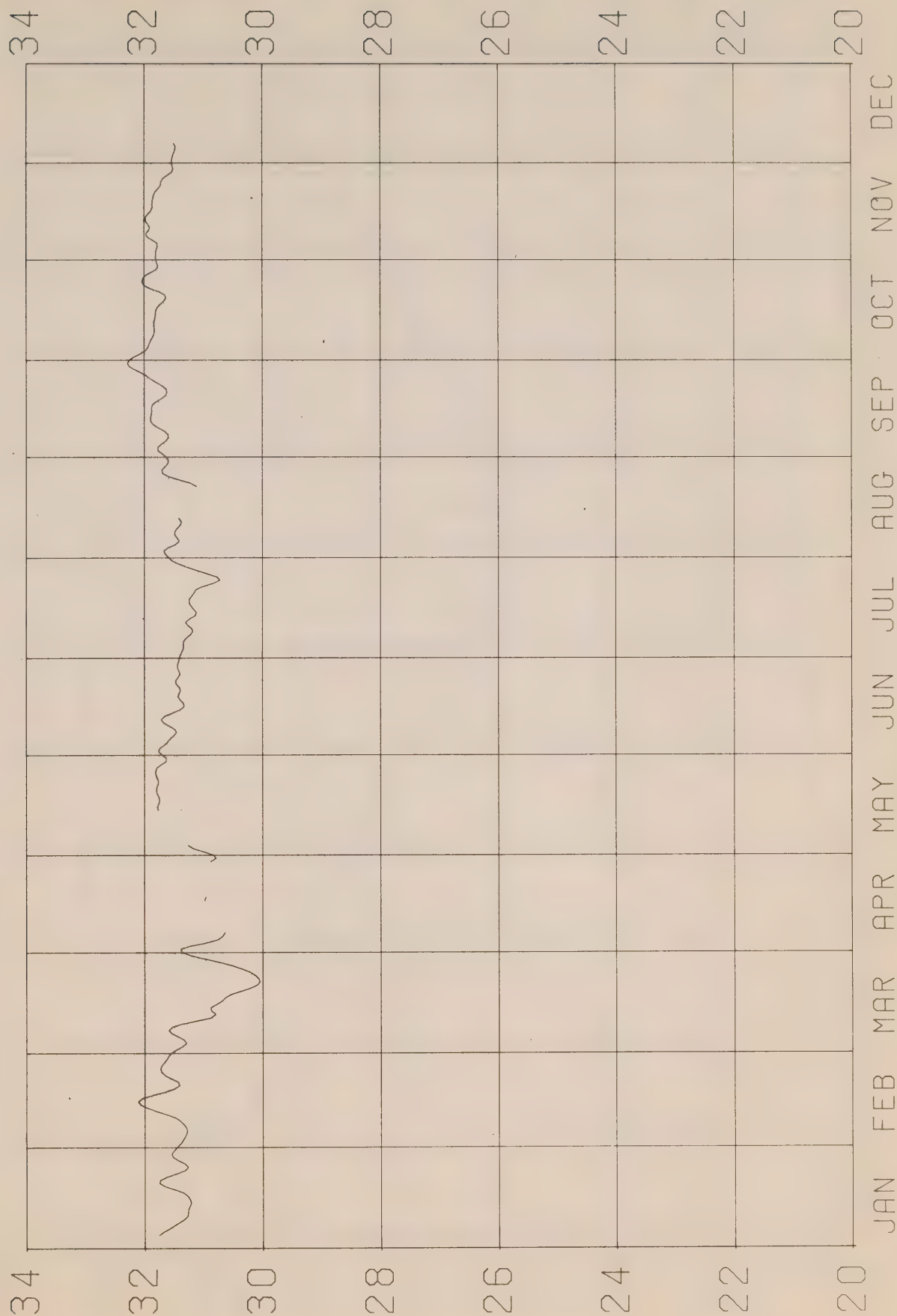


1972 TEMPERATURES

PINE ISLAND

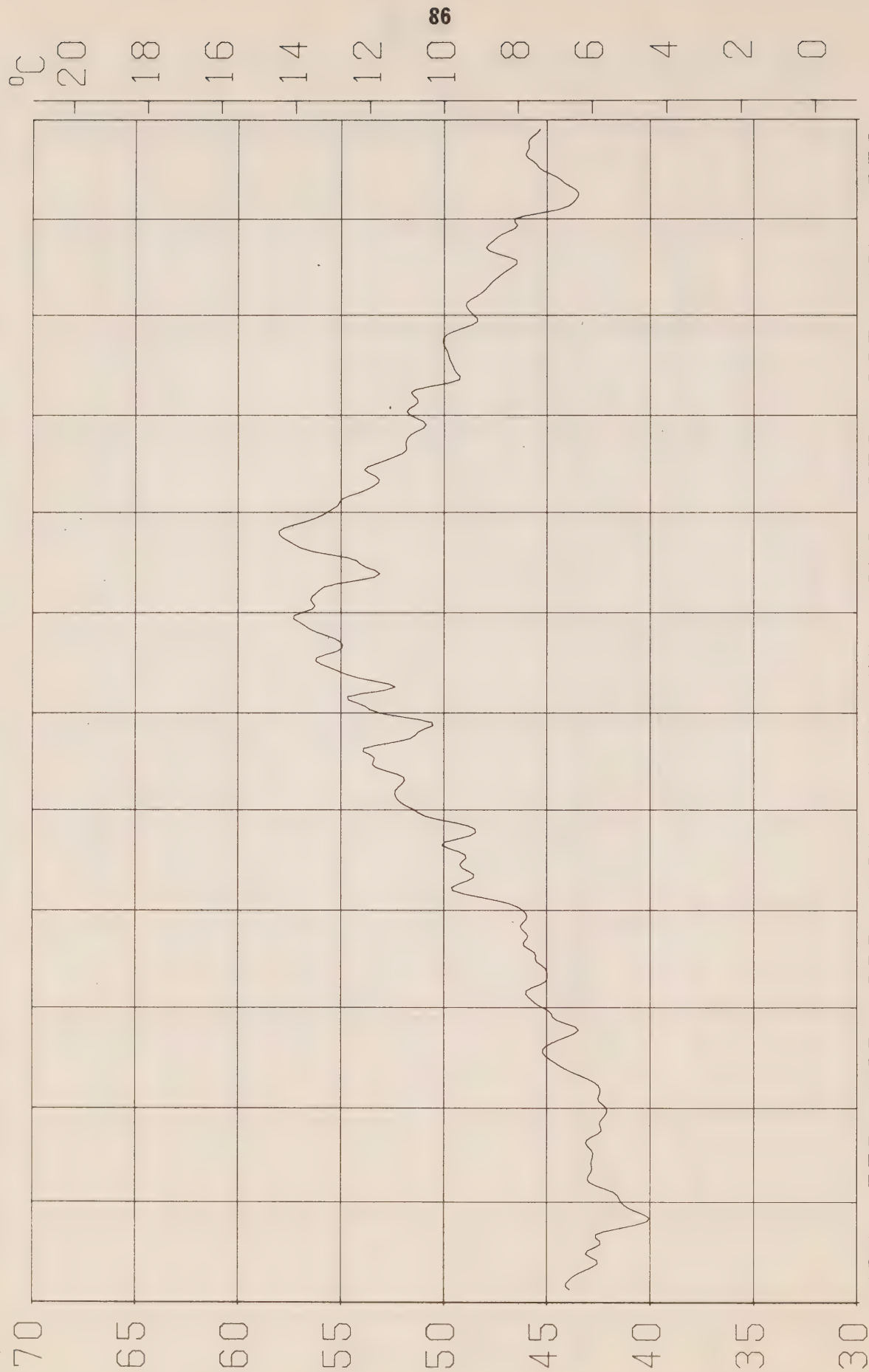


PINE ISLAND 1972 SALINITIES



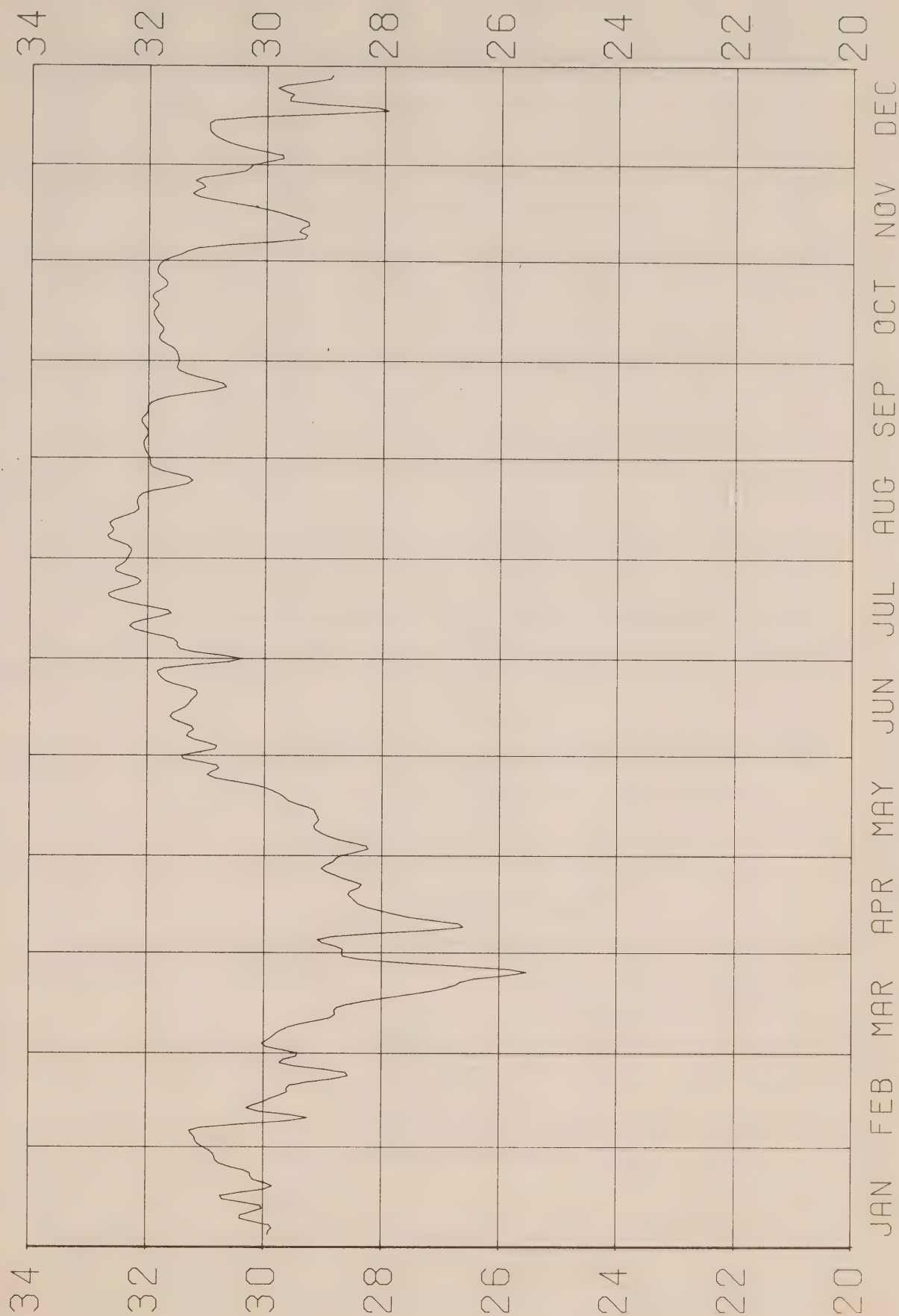
°F KAINS ISLAND

1972 TEMPERATURES

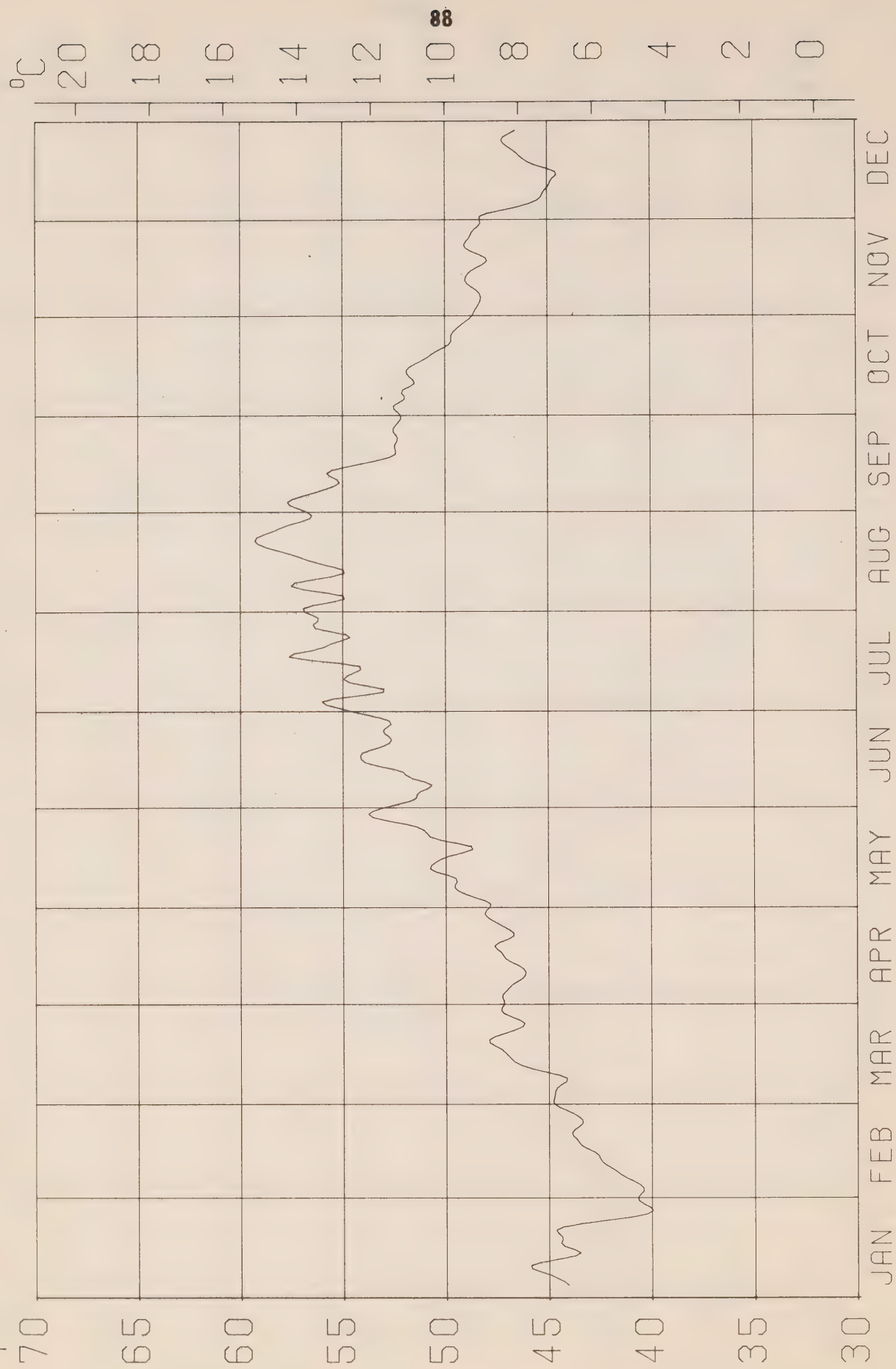


KAINS ISLAND

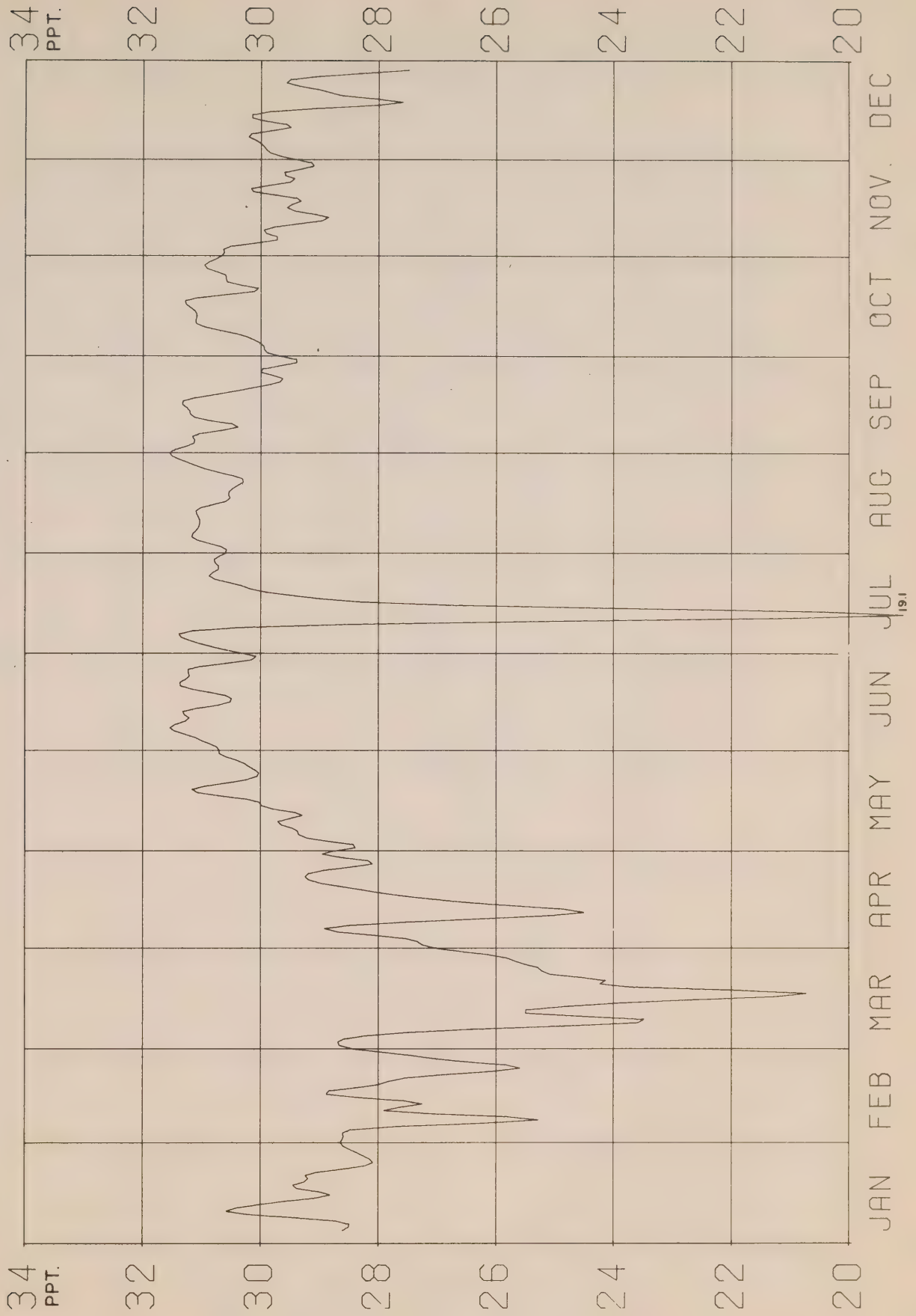
1972 SALINITIES



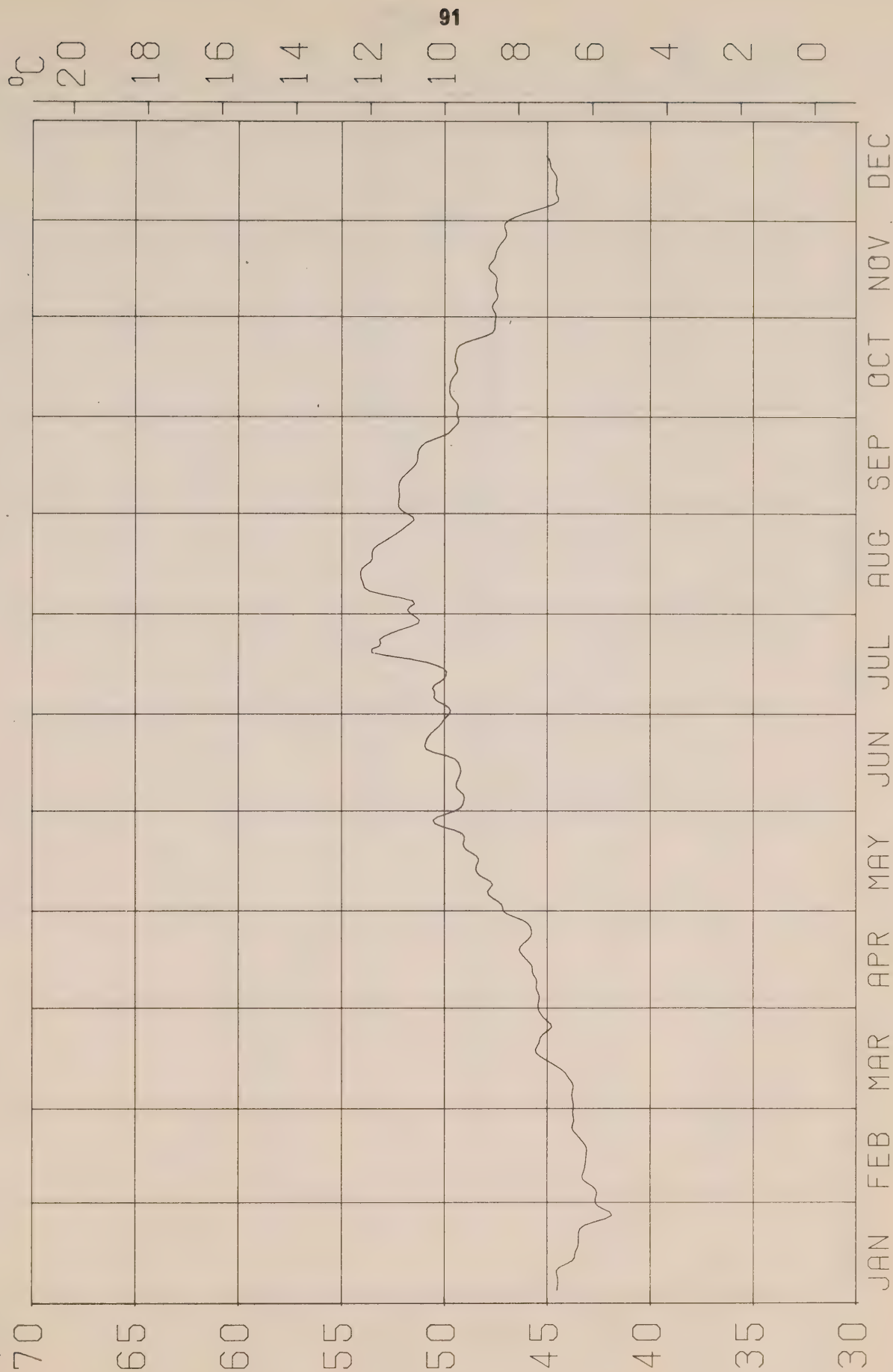
AMPHITRITE POINT 1972 TEMPERATURES



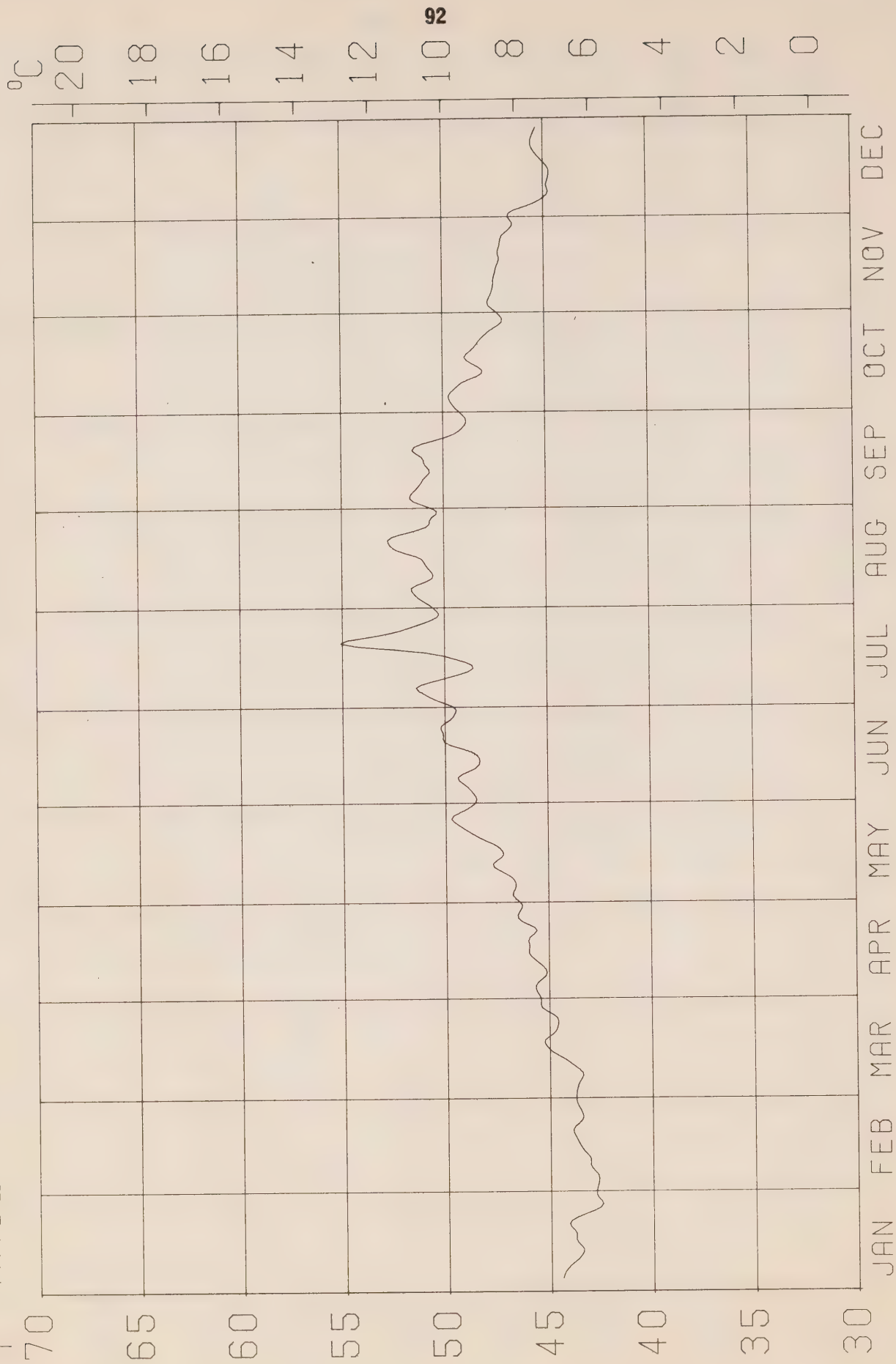
AMPHITRITE POINT 1972 SALINITIES



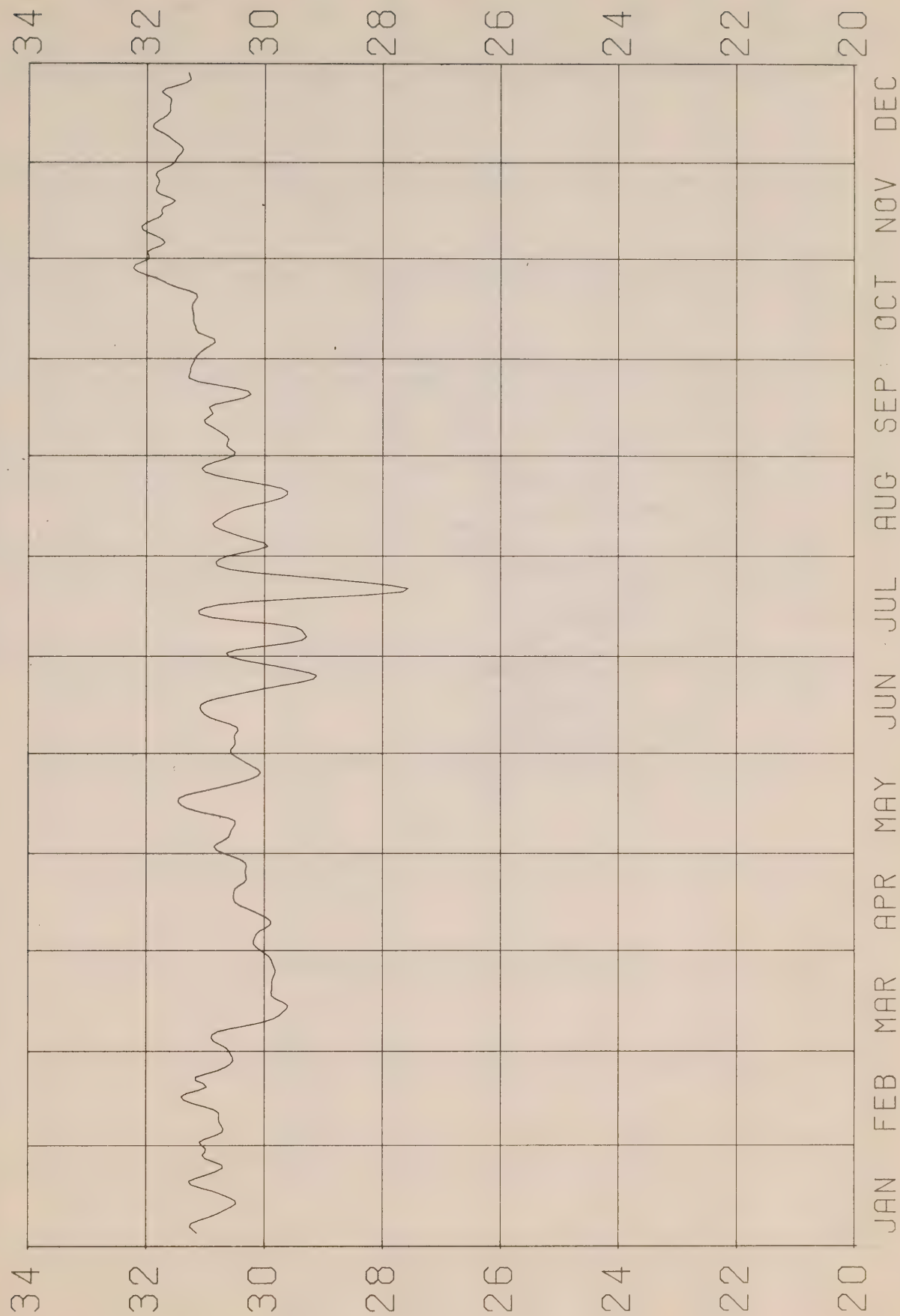
SHERINGHAM POINT 1972 TEMPERATURES



RACE ROCKS 1972 TEMPERATURES



RACE ROCKS 1972 SALINITIES

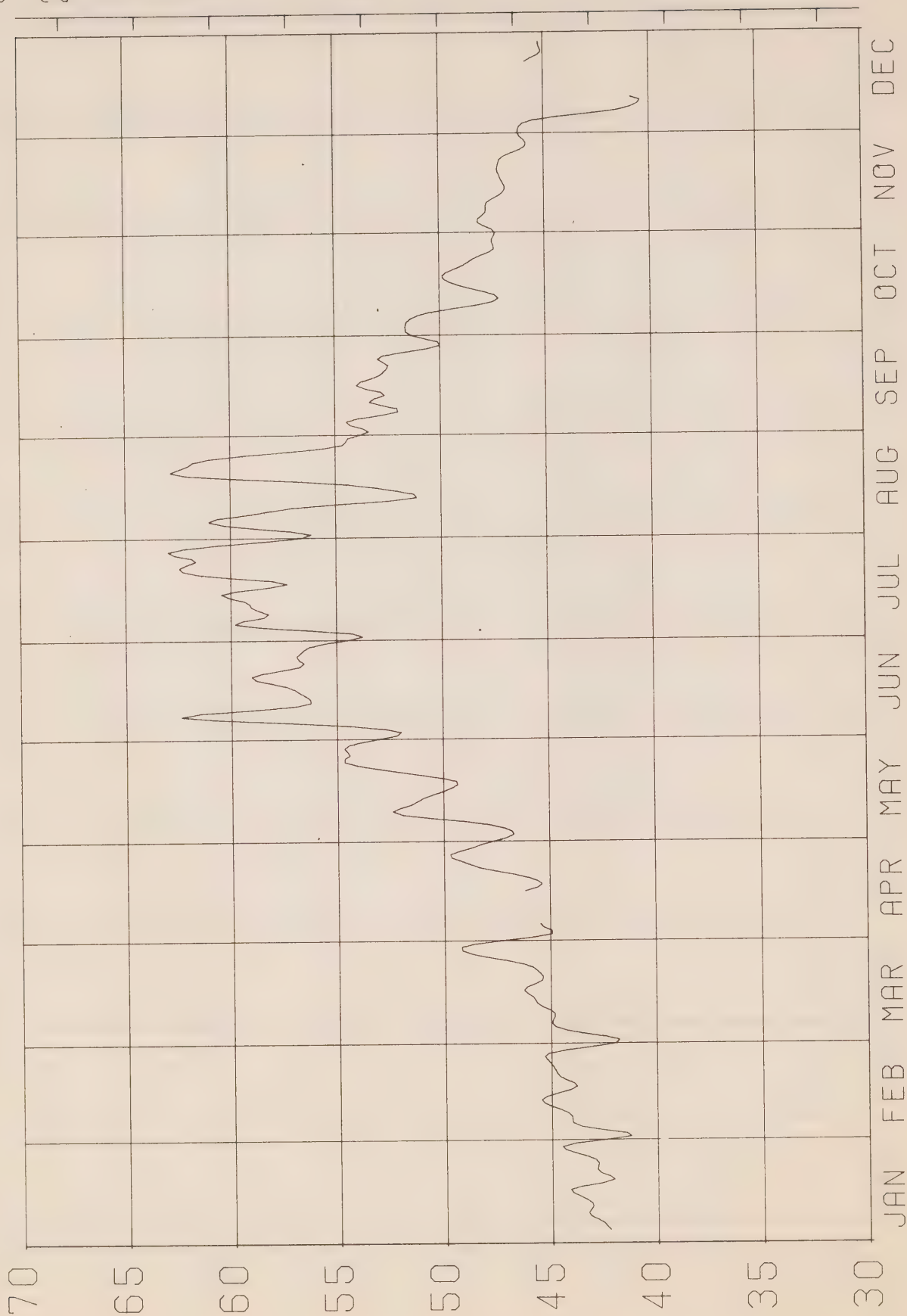


1972 TEMPERATURES

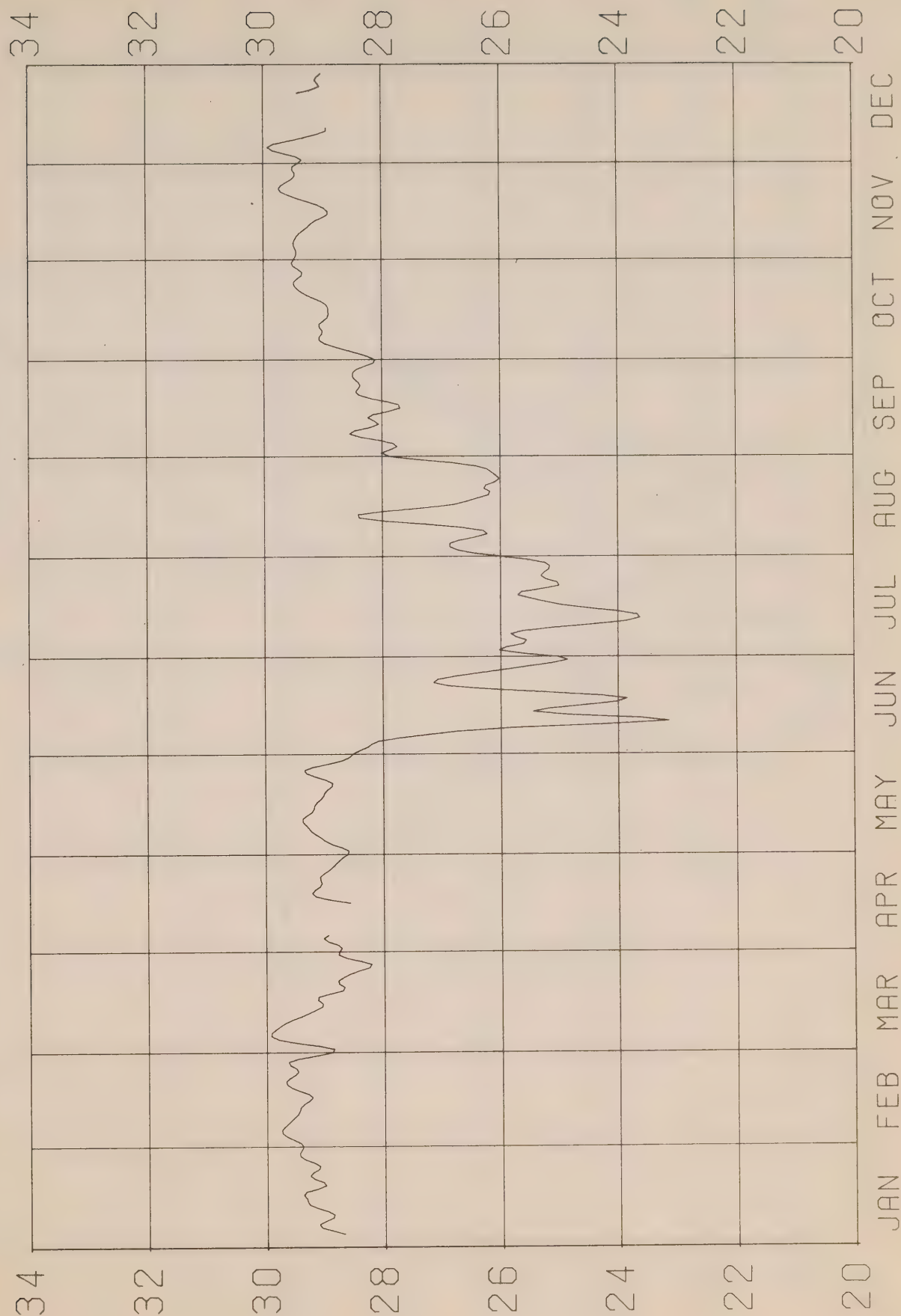
CAPE MUDGE

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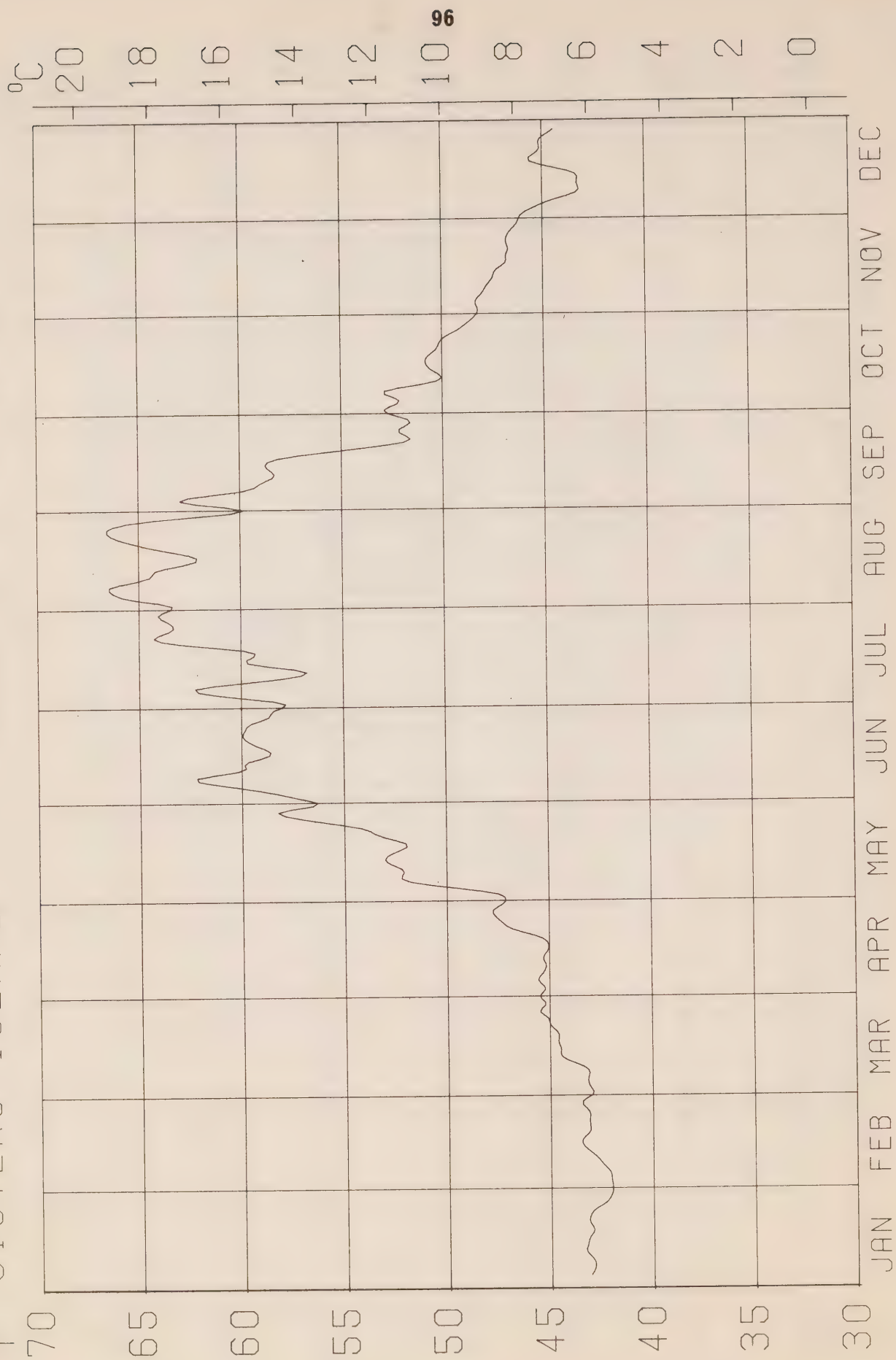
94



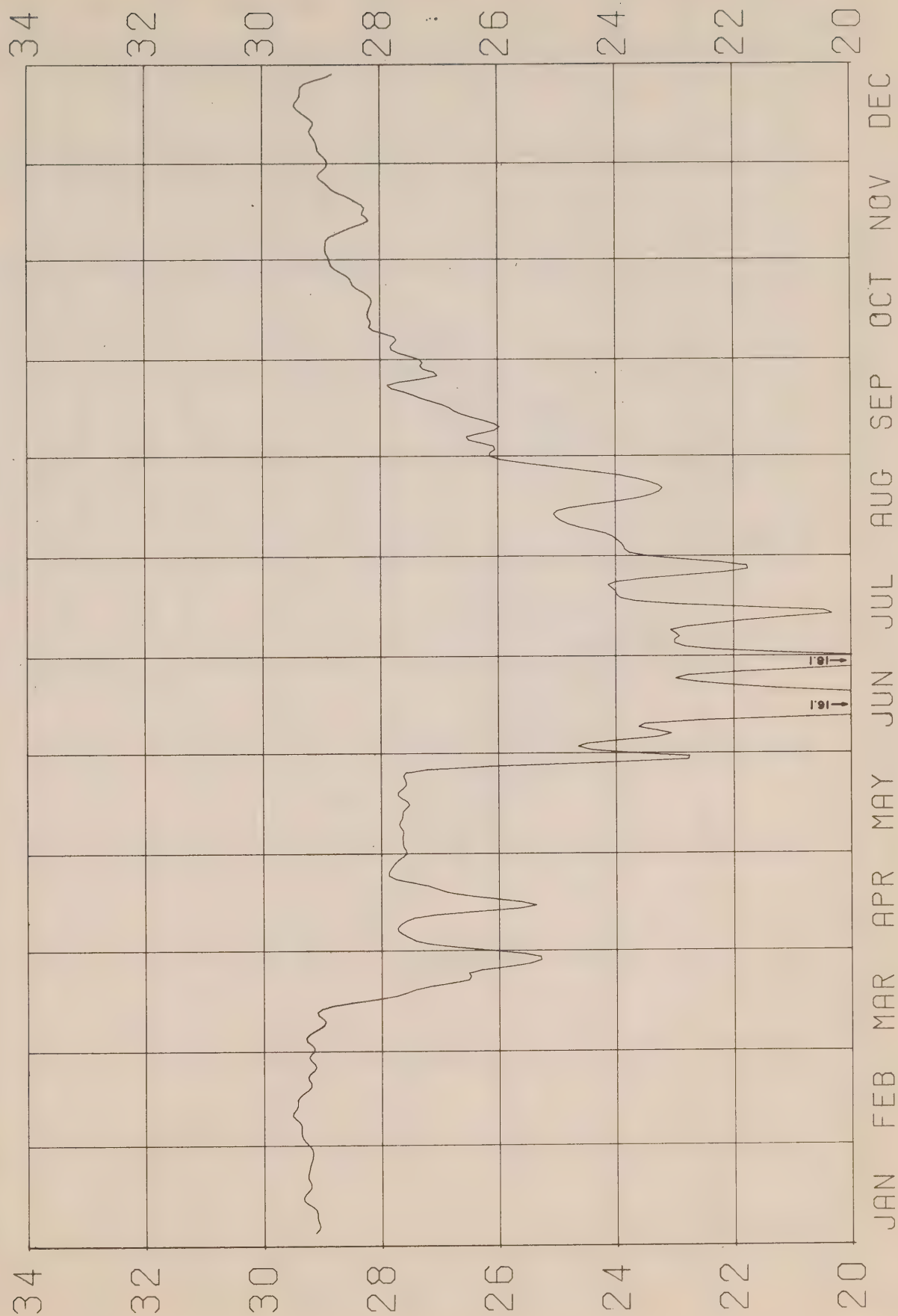
CAPE MUDGE 1972 SALINITIES



SISTERS ISLAND 1972 TEMPERATURES



SISTERS ISLAND 1972 SALINITIES



°F CHROME ISLAND

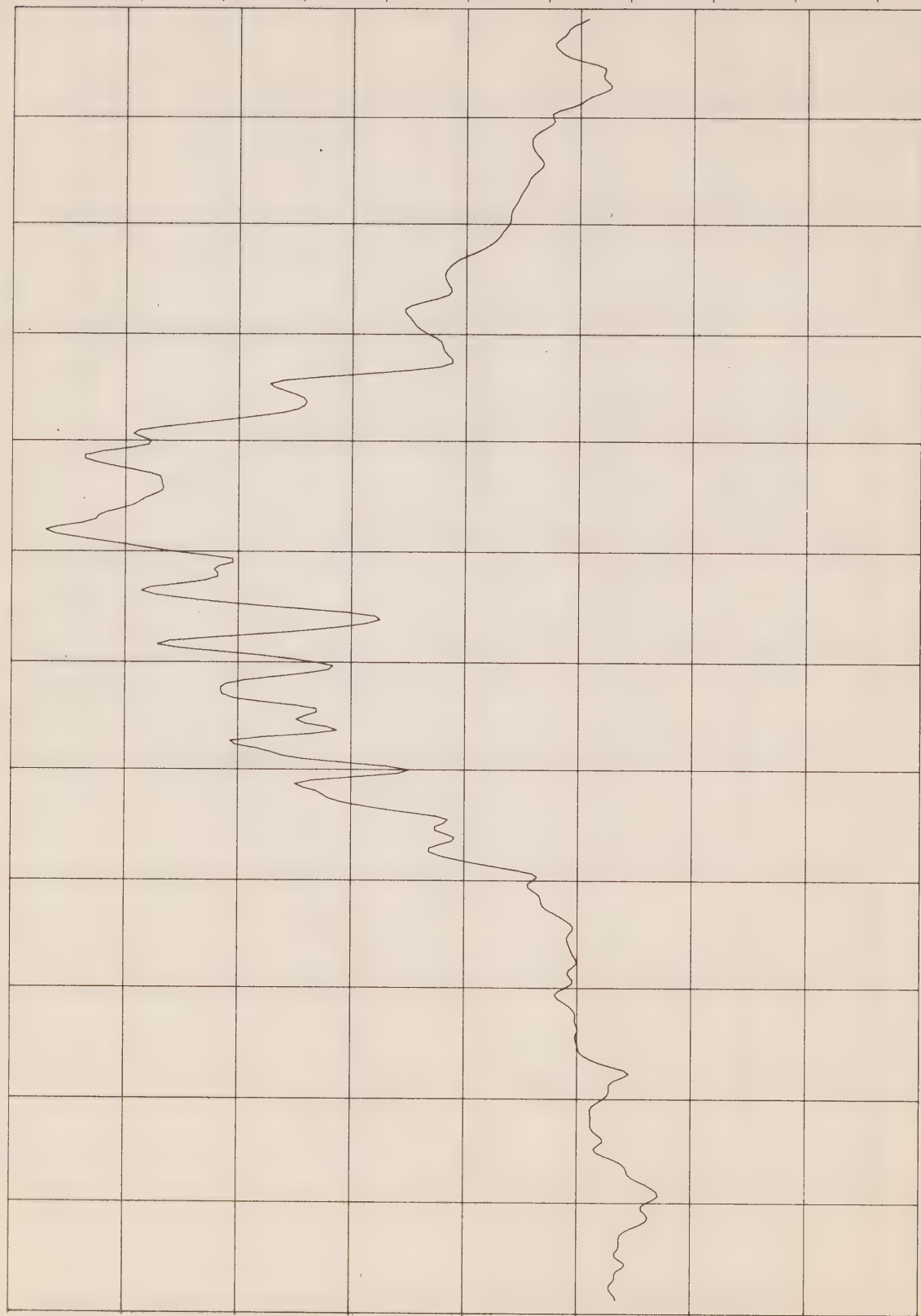
1972 TEMPERATURES

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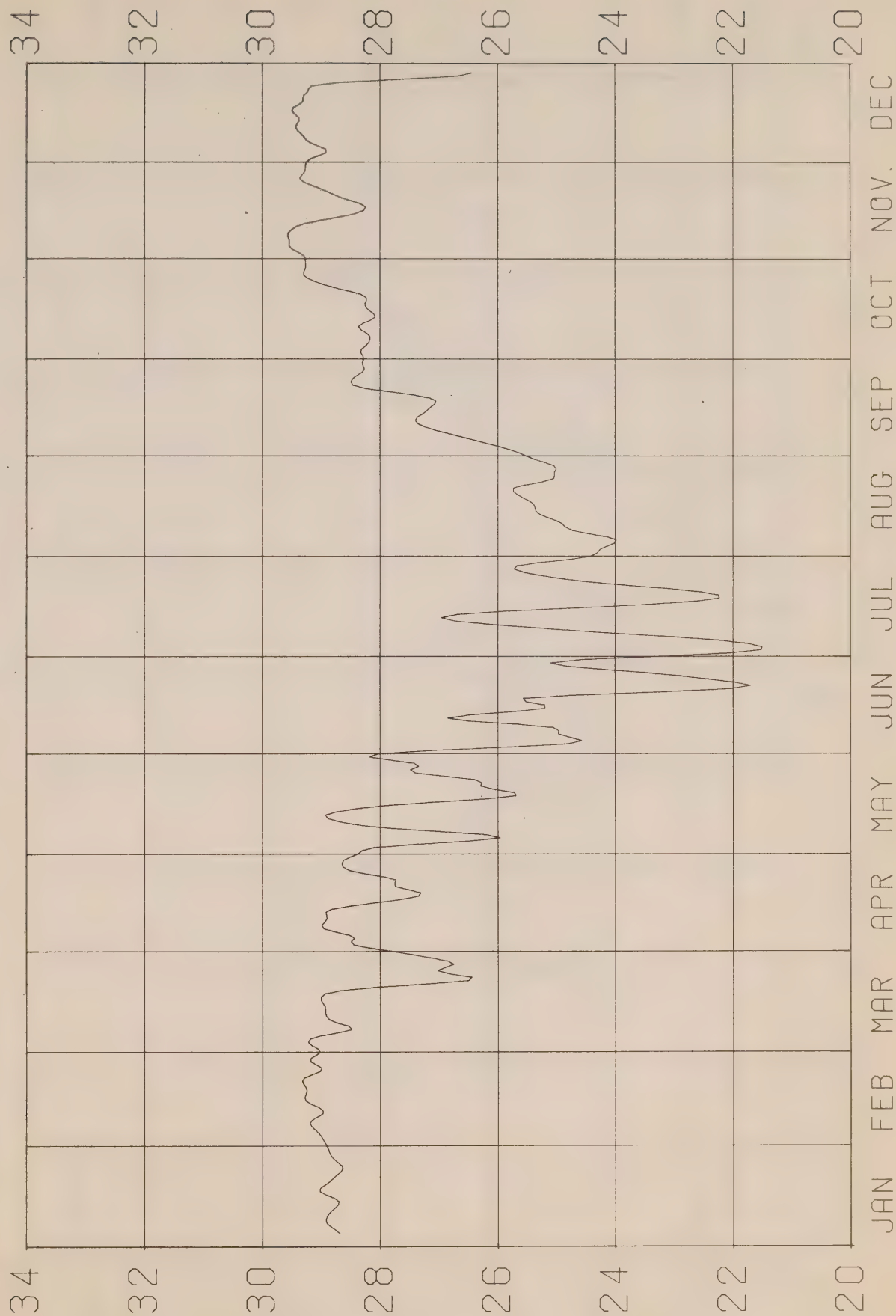
98

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

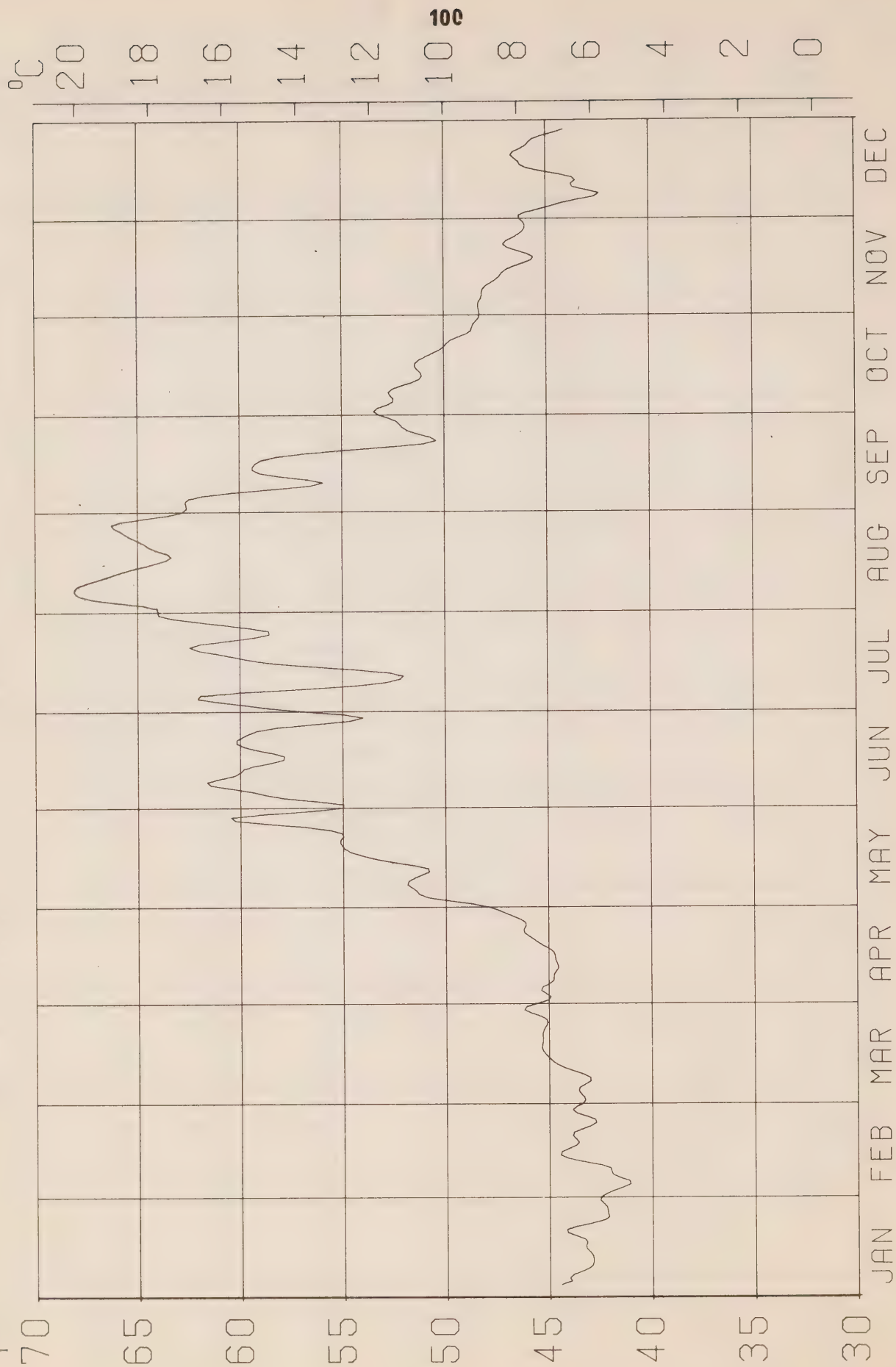
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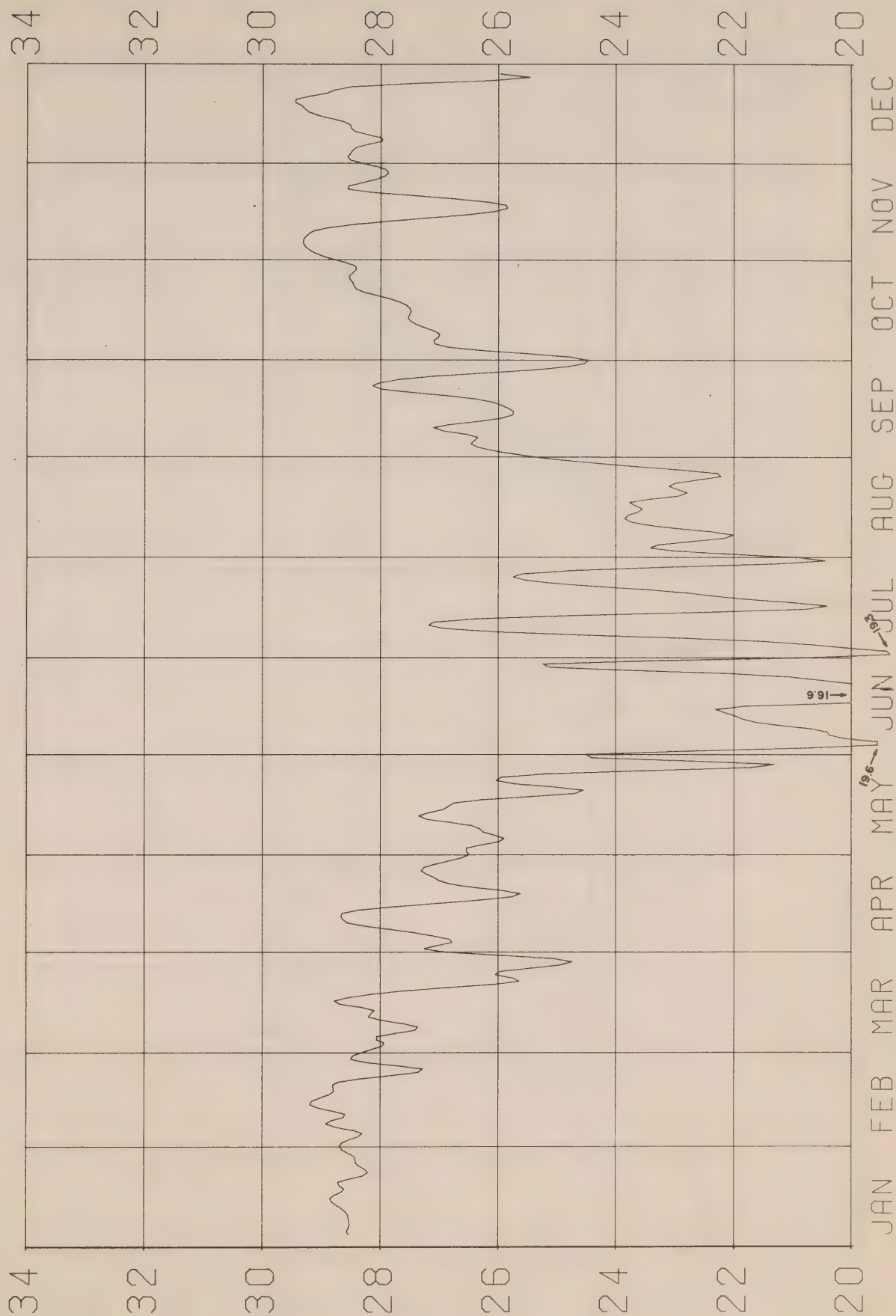
CHROME ISLAND 1972 SALINITIES



ENTRANCE ISLAND 1972 TEMPERATURES



ENTRANCE ISLAND 1972 SALINITIES



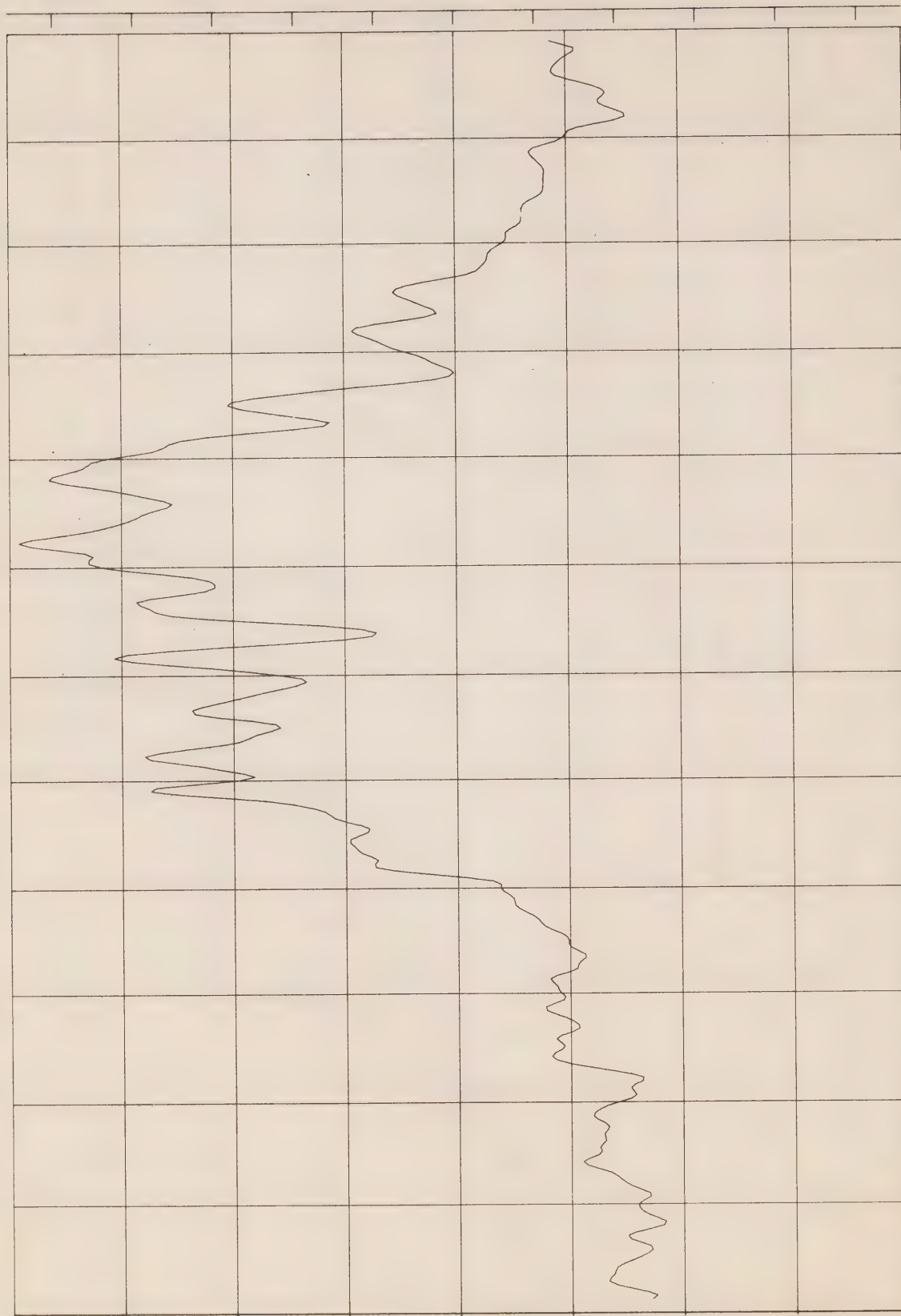
DEPARTURE BAY 1972 TEMPERATURES

°F

20
18
16
14
12
10
8
6
4
2
0

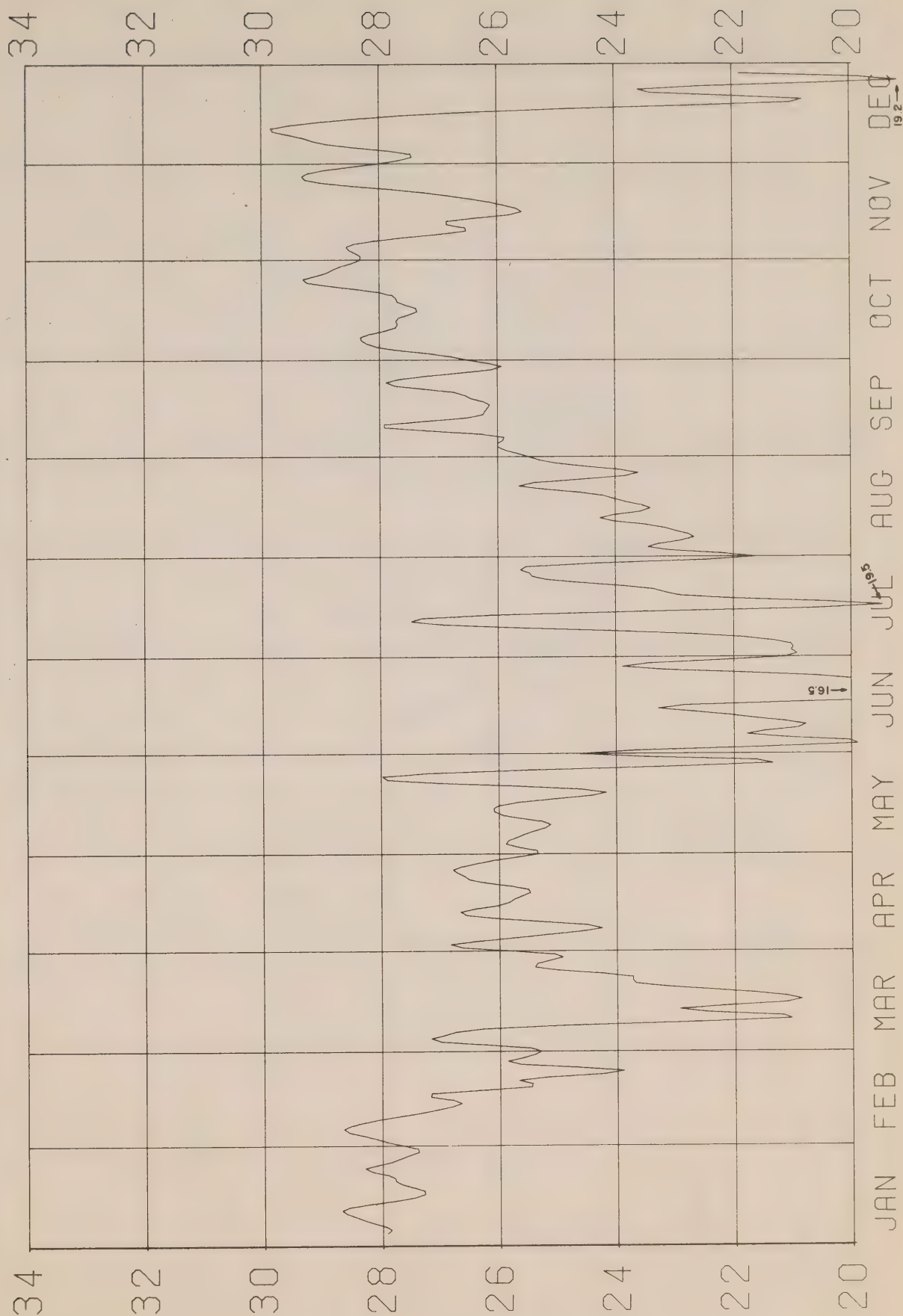
102

70
65
60
55
50
45
40
35
30

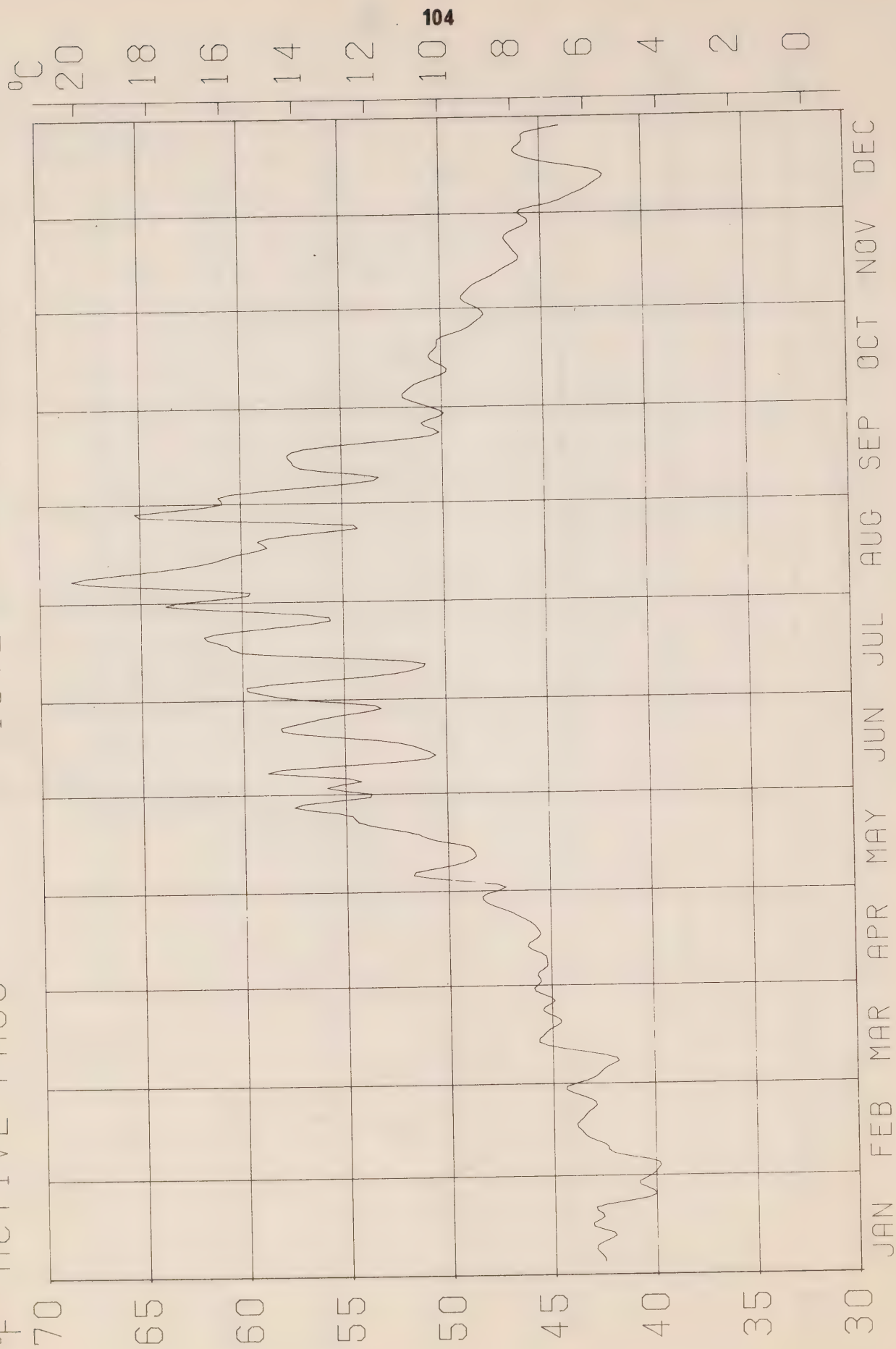


JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

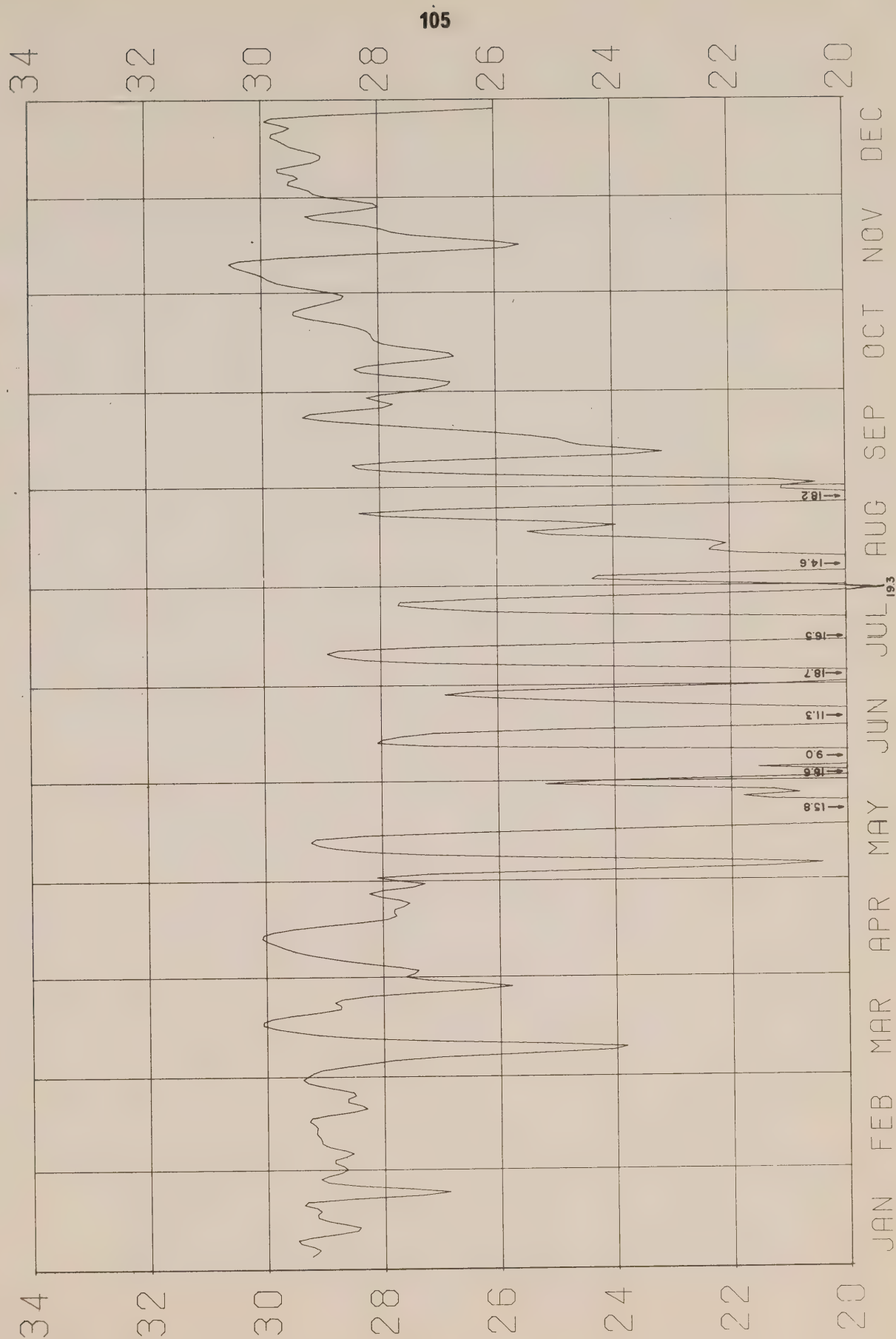
DEPARTURE BAY 1972 SALINITIES



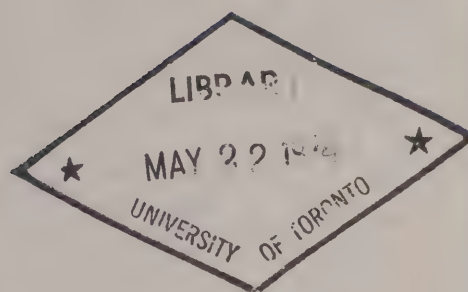
ACTIVE PASS 1972 TEMPERATURES



ACTIVE PASS 1972 SALINITIES



THE USE OF ERTS-1 COMPUTER COMPATIBLE TAPES WITH RESPECT TO MARINE RESEARCH



by

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1. INTRODUCTION

On July 23, 1972 NASA launched ERTS-1 (Earth Resources Technology Satellite). The satellite is in a near polar circular orbit at an altitude of approximately 600 miles with a field of view 115 miles wide, and is designed to transmit high-resolution images of the earth's surface to receiving stations on the ground. Weather satellites send down such images with resolutions of typically several miles; ERTS-1 provides a resolution of about 260 feet and the pictures have been found useful in a wide variety of environmental sciences including geology, agriculture, and oceanography.

The satellite carries two sensors. One, a 3 band Return Beam Vidicon (RBV) camera system, has provided very little imagery, and no data from it is discussed in this report. The other, a 4 band Multi-Spectral Scanner (MSS) system, has provided imagery continuously since July 25, 1972.

The area of the earth's surface imaged each day is limited by the satellite's field of view, its orbital path, available receiving stations, and cloud cover. (The satellite's detectors cover from the green to the near infrared (0.5 to 1.1 μm) and even at the longer wavelengths have only slightly greater cloud penetrating ability than the human eye.) For Canada, which has its own receiving station at Prince Albert, Saskatchewan (PASS), the MSS is still providing pictures along a total of about 15,000 miles of orbital track over Canada each day. The large amount of data collected is normally made available to users by the Canada Centre for Remote Sensing in the form of black and white photographic prints, one per 115 mile square scene per band, or as colour prints in which a false colour composite is formed from 3 bands.

This report is concerned with the analysis of ERTS MSS data on computer compatible tapes (CCT's) which carry the original radiance values measured by the satellites in digital form. The data has not been through any stages of photographic reproduction and is therefore free of the resulting degradations and distortions. Large amounts of data in all 4 bands can be computer processed to give many different types of enhancement, averaging, spectral signature recognition, filtering, and geometrical manipulation. For many simple analyses the photographic products are much more convenient and cheaper to use, especially if many scenes are to be quickly scanned, but for scenes of

special interest the CCT's have important advantages. Several examples of computer processing are given in this report. The emphasis is on water radiance measurements, though programs developed could be used for many other purposes.

We have analysed three tapes of the ERTS scene covering Vancouver and Victoria, British Columbia. This scene covers an area centered on $48^{\circ}50'N.$, and $123^{\circ}10'W.$, and 115 miles square. It includes parts of the Straits of Georgia and Juan de Fuca, the lower Fraser Valley below Hope with the Fraser delta and river plume, mud flats, and the gently shelving sandy Boundary Bay and freshwater lakes north of Vancouver and on Vancouver Island. Patches of fog and cloud are also present as well as urban and agricultural area, snow covered mountains, forests with logged areas of different ages, and other features that could be useful to investigations in a number of fields.

Two Canadian data tapes of this frame from the Canada Centre for Remote Sensing were used. One was taken on 4 September 1972, Number E-1043-18364; the other was taken on 9 January 1973, Number E-1169-18373. One U.S. tape from the EROS Data Centre in Sioux Falls was also used. This frame, Number E-1007-18365, was taken over the same area on 25 July 1972.

All the computing was done on an HP 2116 series mini-computer using a Versatec 80 column line printer and Calcomp drum plotter for display of output.

2. THE MULTISPECTRAL SCANNER (MSS)

Scanning devices have the potential of forming images with a single detector which can be made extremely sensitive and stable, and which can be chosen to operate at a wide variety of wavelengths. The geometrical accuracy of a scanner is limited by tolerances in the scanning mechanism or by the stability of the vehicle or platform used. A scanner can therefore exploit the short term stability of the satellite. Since the detector used can also be a multi-channel spectroscopic device, the scanner can make spectral measurements of radiation received from its instantaneous field of view.

The ERTS MSS scans the ground beneath the satellite with a square instantaneous field of view 260 feet across. The scan covers 115 miles at right

angles to the satellite's track while the satellite's orbital velocity advances the scan lines along the track. For no ground to be missed, a scan would need to be repeated every time the satellite had advanced 260 feet. The MSS actually has 6 instantaneous fields of view which scan 6 adjacent lines on the earth's surface. The scan frequency is thus reduced (to 13.62 Hz) but the 6 separate detectors that are needed will now tend to have different responses and in fact a faint stripiness is visible on ERTS MSS imagery due to this.

A filter system splits the radiation from each instantaneous field of view into 4 bands as follows:

Band 4	Green portion of spectrum	0.5 - 0.6 micrometers
Band 5	Red portion of spectrum	0.6 - 0.7 micrometers
Band 6	Near infrared	0.7 - 0.8 micrometers
Band 7	Further infrared	0.8 - 1.1 micrometers

and measures the resulting 6 sets of 4 radiances on a total of 24 separate detectors (photomultipliers for bands 4, 5, 6, photodiodes for band 7). The responses of each of these detectors is checked in turn and calibration curves for each are transmitted along with image data.

A single radiance measurement is coded to a six bit number (0 to 63), and will form a pixel of the resulting image in one band. Each detector is read about 3200 times during each scan, so that for scan lines 115 miles long, a scan frequency of 13.62 Hz and a satellite ground speed of 21,200 ft/sec., pixels represent radiance measurements averaged over 260 foot squares separated 257 feet along track and 188.5 feet across track.

In fact the scanning of the instantaneous field of view is not exactly uniform. Velocity variations up to 1.3% from the average value result in maximum accumulated ground errors of 1300 feet. This error is negligible in most applications, but corrections can be made using data given in Goddard Space Flight Centre publication X-563-73-206.

3. FORMAT OF THE DIGITAL TAPES

Canadian Tapes (from the Canada Centre for Remote Sensing)

Computer Compatible Tapes (CCT's) are available on a per frame basis. The tape options available are: 9 track (1600 or 800 b.p.i.), 7 track (800, 556, or 200 b.p.i.), all being unlabelled 2400 ft. tapes.

For the image and calibration data there are six 6 bit bytes of useful information per word on the tape. The 7 track format has six 6 bit bytes packed simply into each 36 bit word.

The 9 track tape is written with 40 bit words. The following table is one way of handling these 40 bits to get the proper information from the tape:

Byte	One	Two	Three	Four	Five	Six
Bits	1-6	7-12	13-18	19-24	25-30	35-40*

- * Bits 31, 32 are the first 2 bits of byte six
- Bits 33, 34 are 0
- Bits 35, 36 are repeats of bits 31, 32
- Bits 37-40 are last 4 bits of byte six

There are 400 MSS swaths (6 scans/swath, each scan in 4 bands) per tape order, (i.e., per frame). The number of tapes per frame depends on the tape option chosen. For example, our choice of 9 track, 800 b.p.i. required 2 tapes per frame.

The tape set-up is as follows:

- (1) Header Block, 14, forty bit words with 1 word leader followed by an end of record gap. EOR
- (2) Transformation Block, 36, forty bit words with 1 word leader (this block may be omitted). EOR
- (3) Calibration Block, 269, forty bit words with 1 word leader. EOR

(4) Six Data Blocks, each having 2409, forty bit words. The blocks are the 6 separate scans of each swath in 4 bands, written in order of north to south. Each block is followed by an EOR and each has a 1 word leader

(5 to 11) Calibration Block plus 6 Data Blocks. This sequence of 7 blocks is repeated to the end of the tape.

We have used no information in the leader or transformation blocks. On some of the tapes we received they were in any case absent.

Calibration Block

Every second calibration block has calibration data for a detector (photo-multiplier or photodiode).

<u>40 Bit Word #</u>	<u>Description</u>
1	Word leader
2	Number of days from beginning of year
3	Satellite time code (G.M.T.) in units of 10 microseconds
4	Line length code (LLC): (Valid pixels x 25) + 49. (LLC - 49)/25 = M with Remainder N. The line length for the first N detectors is M + 1 and is M for the remaining detectors
5	Detector code $[(\text{band} \times 2^{18}) + \text{detector \#}]$
6-270	Calibration data for above detector
End of record	

NOTE: We refer to the bands as 4, 5, 6, and 7 by convention while the computer labels them in word #5, as 1, 2, 3, 4.

Data Block

<u>40 Bit Word #</u>	<u>Description</u>
1	Word leader
2-601	3600 six bit bytes of light intensity readings from detector 1 of band 4
602	Sum of first 2048 bytes of MSS data from detector 1, band 4
603	Sum of squares of first 2048 bytes of MSS digital data from detector 1, band 4 (divided by 64)
604-1205	Readings from detector 1, band 5
1206-1807	Readings from detector 1, band 6
1808-2409	Readings from detector 1, band 7
End of record	

Each block contains data for 4 bands for one scan from west to east across the picture frame. The end of the scan is marked by numbers 0, 0, 0, 0, 63, 63, 63, 63.

We received our first Canadian tapes in April 1973 when production was just starting. More recent tapes have fewer errors, but we still find:

- some scan lines containing only zeros, some containing random numbers
- insertion or dropout of data in some scans. For example, in the September tape, data from the 4th detector for band 7 appears unreliable. On earlier tapes of this same scene we found other detectors affected so that this problem is presumably in the data processing. The fault causes a shift in the end of scan marker for the line, but the shift is not constant throughout the line and is difficult to correct

- response differences leading to stripiness in the image data. This effect is also discussed later
- some calibration blocks that should contain data contain only zeros, others are not exactly as specified (see Section 5)

U.S. Tapes (from the EROS data Centre, Sioux Falls)

The tape options available are 9 track 800 b.p.i. or 7 track (800 or 556 b.p.i.). Data on the tape is mostly in binary but some of the ID and Annotation Blocks are in EBCDIC.

There are 4 separate CCT's for each scene. Each tape contains video data for all 4 bands of one quarter of a frame. Each quarter is a strip parallel to the satellite track 46.25 km wide and 185 km long.

Tapes are available in two different formats, 'system' or 'scene' corrected. Scene correction involves use of ground control points to determine geometrical errors in the imagery. We have only had experience with system corrected tapes and only these are discussed in this report. In this format the bands are pre-registered, some errors are tagged for automatic processing, extra pixels are inserted occasionally to equalize scan line lengths, and the detector responses are balanced, and also linearized, by transforming the image data to the decompressed mode. Note, however, that NASA refers to compressed data as being in the linear mode before this transformation.

There are 3 types of record on the scene corrected tapes: ID, Annotation, and Video.

ID Record

The ID record is the first record on the tape and contains 40 bytes. It is a combination of binary and EBCDIC information which can be used to identify the video data.

<u>Byte #</u>	<u>Description</u>
1-12	Scenes/frame identification, given in terms of days, hours, minutes, and tens of seconds since launch. Also indicates spectral band, sequential subframe ID, and whether it is ERTS-1 or ERTS-2
13-16	Sequence numbers which distinguish the tapes in the set of four (i.e., 2 of 4)
17-18	Data record length (binary)
19-26	Frame ID (binary)
27-28	Strip ID (binary)
29-36	Image annotation tape ID used in making CCT
37-38	MSS data mode/correction code
39-40	Adjusted line length

Annotation Record

The annotation record is the second record on the tape and contains 624 characters. The first 144 bytes (72 sixteen bit words in EBCDIC) contain the annotation block and the remaining 480 bytes comprise the image location record. For a complete listing of this record, see publication number X-563-73-206, from Goddard Space Flight Center, Greenbelt, Maryland, U.S.A.

Video Data Record

The final records on the tape are video data records. There are 2340 video data records (scan lines), each containing 3000 to 3450 pixels and a 56 byte calibration group. The pixels are contained in 8 bit bytes; 6 (right justified) of the 8 bits contain data if in the compressed mode.

Data from the four MSS bands are interleaved to form 8 byte groups containing 2 pixels from each band of the same ground scene. The order of the bands

within the group is:

<u>Byte</u>	<u>Band</u>
1, 2	4
3, 4	5
5, 6	6
7, 8	7

Registration of the bands is accomplished by filling certain bytes with dummy values (255_{10}) within the first and last 3 groups of a scan. (i.e., the first 3 groups on tape 1 of 4 and the last 3 groups of tape 4 of 4.)

The 56-byte calibration group at the end of each video record contains four 14-byte sub-groups pertaining to each of the four MSS bands. The description of each 14-byte section is as follows:

<u>Byte #</u>	<u>Description</u>
1-6	Six calibration wedge samples
7-8	Sun calibration coefficient (K_s) x 2048
9-10	Filtered detector response offset x 256 (a_i)
11-12	Filtered detector response gain x 16384 (b_i)
13-14	Unadjusted line length for a band

The same types of errors appear in the U.S. image data as on the Canadian tapes. U.S. calibration data showed no unexpected effects.

Having used data with both these two formats, we would make the following comments on the U.S. data's differences:

- the fact that U.S. data is already unpacked into 8 bit bytes is very useful, especially since our computer HP 2116, and all IBM models use 8 bit bytes
- we did not find the fact that U.S. data was decompressed particularly useful, since in our sample the differing detector responses were not well corrected

- splitting of the image into 4 strips parallel to the satellite's track we found particularly inconvenient, especially when each strip is written on separate tapes and four are required per frame
- the more compact form of the calibration data in U.S. tapes is certainly more convenient. The Canadian data could be considerably compacted, especially since gain variations seem to be always very slow

In general we feel that a better format using the best points of both U.S. and Canadian tapes would be an improvement. The format described in the next section goes part of the way by unpacking the Canadian data, leaving complete scan line intact and still requiring only two tapes per frame.

4. INITIAL ANALYSIS OF ERTS IMAGE DATA

(a) Format Conversion

ERTS image data from CCRS has a 40 bit per word format with the data arranged as described in the previous section. It was found most convenient to translate the entire tape into a format in which each pixel occupied an 8 bit byte, with the scan line registration corrected for the band to band offset. The record lengths were reduced by cutting the data records in 4, (one for each band) and retaining only 3200 pixels of image data per line. Thus about 18 good pixels per line were rejected along with about 380 pixels of 'padding'. Calibration data was copied directly although considerable reduction is possible as discussed in the next section.

The new format allows all of a CCRS tape to be rewritten onto one other tape, giving two tapes per frame.

This format change is not needed with the U.S. data, which already has the image data in 8 bit bytes.

(b) Scan Line Plots

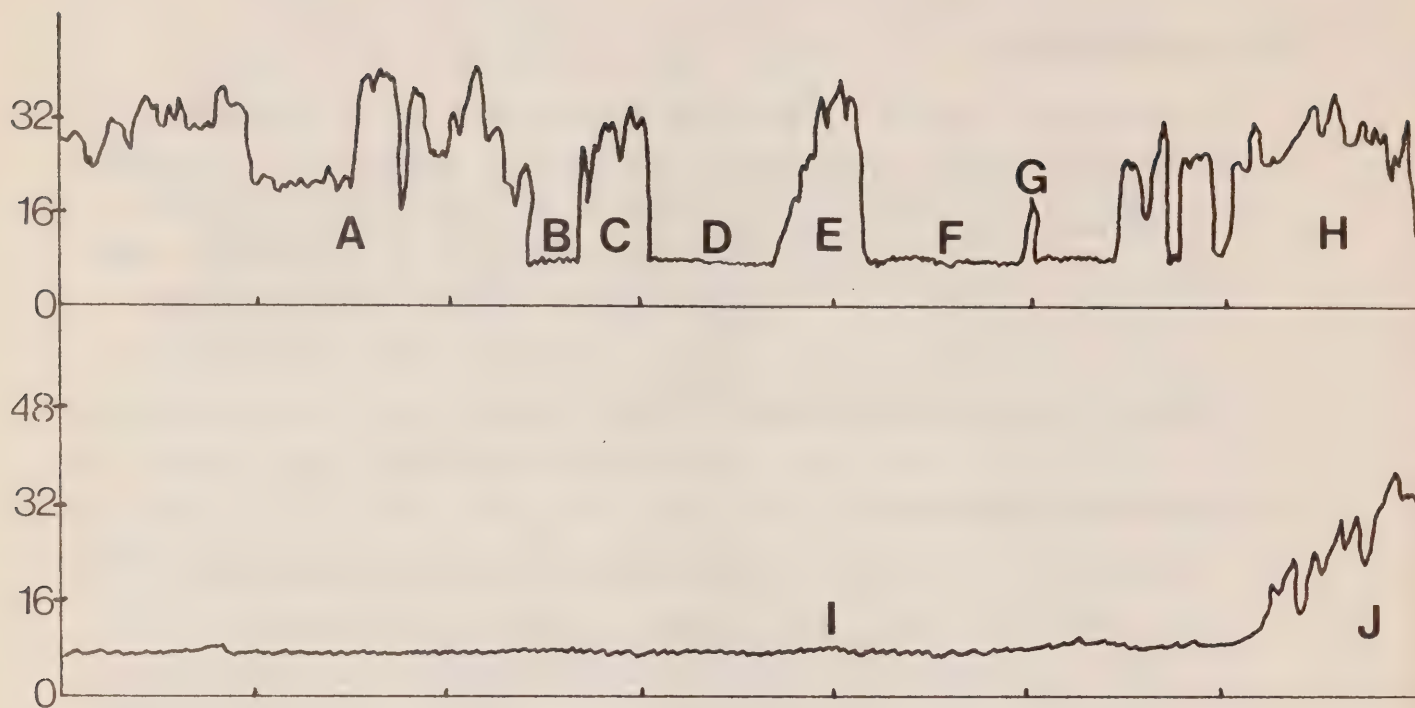
By producing a plot of one scan line approximately every ten miles, it is possible to get a rough idea of how the tape compares to the picture. From this one can deduce where to look on the tape for more specific areas. These scan lines give the same information as densitometer readings across an ERTS image transparency, but without the degradations inherent in the photographic process. A portion of two scan plots is shown with the corresponding ERTS image in Fig. 1.

(c) Character Density Maps

A picture of a given area can be formed out of aligned segments of consecutive scan lines. Fig. 2 shows a character representation of a specific area formed by grouping the digital numbers and representing them with characters of different density. In this example the numbers have been divided into 7 groups represented from lower to higher value groups by _ . , / T M. It is possible to have up to 64 groups represented by different density characters and thus have maximum resolution of radiance differences, but one is limited by the character set available. Over-printing allows darker shades to be formed and on some printers special character sets may be available for shading, but it would in any case be difficult to represent all 64 levels.

(d) Maximum Resolution

By printing out the actual numbers in the same geographically oriented manner the maximum satellite information is observed. In Fig. 3, one can see that the MSS (band 6) detected the First Narrows Bridge (a span 40 ft. in width and 1500 ft. long), connecting Stanley Park to the North Shore. The form of detection is as a single number jump in each of the detectors concerned.



LEGEND

- | | |
|-------------------------------------|--------------------|
| A - Mainland | F - Howe Sound |
| B - Thornbrough Channel, Howe Sound | G - Bowyer Island |
| C - Gambier Island | H - North Shore |
| D - Gambier Harbour | I - Georgia Strait |
| E - Gambier Island | J - Fraser Valley |

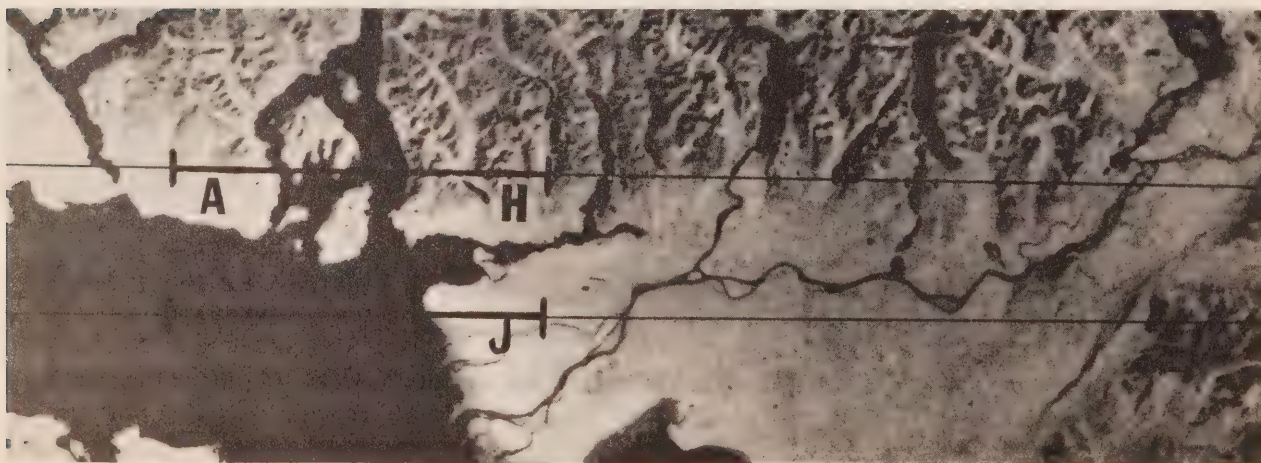
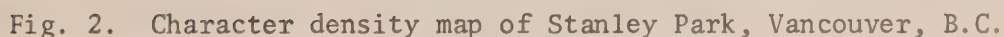


Fig. 1. Plots of parts of two scan lines in band 6 with the corresponding image. Letters identify named features.



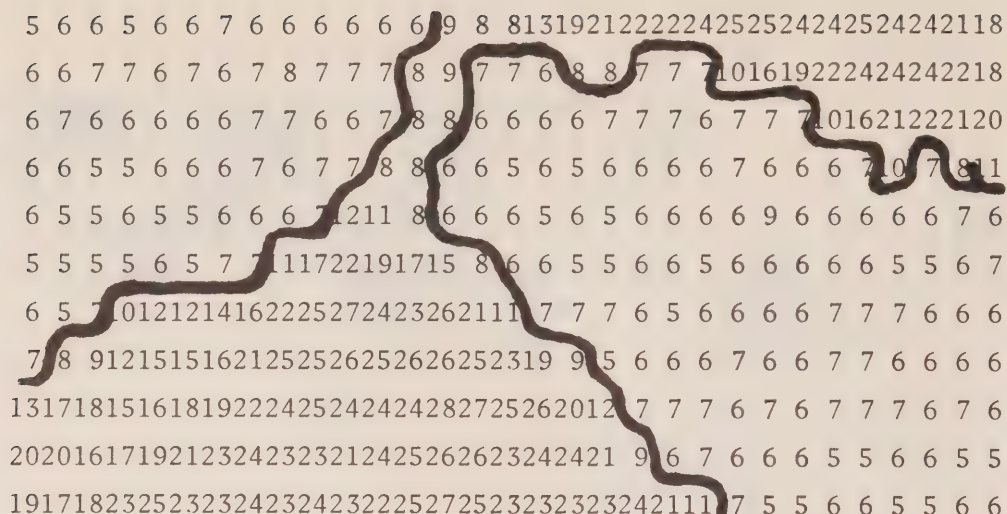


Fig. 3. The area near First Narrows Bridge, Vancouver.
Band 6. U_6 values.

These numbers have been corrected for the stripes mentioned in the previous section, by applying an 'ad hoc' addition of 0, 1, or 2, to the scan lines corresponding to some of the sensing elements.

From the calibration data (next section), we can see that the radiance increase over the bridge (to about 8.2 from an average water value of 6.2) corresponds to $0.23 \cdot 10^{-4} \text{ W/cm}^2/\text{sr}$, whereas the expected step from water to a concrete surface (6.2 to 24) corresponds to an increase of $2.8 \cdot 10^{-4} \text{ W/cm}^2/\text{sr}$. We would therefore deduce that the bridge covered about 10% of the instantaneous field of view, corresponding to a width of only about 20 ft. It appears that the signal from the bridge is smeared over 2 pixels, in which case the total radiance increase of $.46 \cdot 10^{-4} \text{ W/cm}^2/\text{sr}$ would correspond to nearer the actual bridge width of 40 ft.

Similar digital pictures of a B.C. ferry are shown in Figs. 4a and 4b.

6	6	6	6	6	6	6		0	-1	-1	0	-1	-1	2
8	7	7	6	7	7	7		1	-1	-2	-2	0	-1	-2
6	6	6	12	9	6	6		-1	-2	-1	15	9	-3	0
7	7	9	15	9	5	7		1	1	6	24	9	-2	0
6	6	6	11	11	6	6		0	0	0	12	16	2	-1
7	6	6	9	8	6	6		1	0	1	7	7	-1	-1
7	6	7	9	7	7	6		0	0	2	7	2	0	0
8	8	8	8	7	6	6		-1	1	2	2	-1	-1	0
6	6	7	7	6	5	6		0	2	0	1	1	0	0
6	7	6	7	7	6	6		-1	0	-1	0	1	1	0
4a								4b						

Fig. 4. North bound B.C. ferry on ERTS image

Fig. 4a shows the numbers from a single band without any corrections.

In Fig. 4b bands 4, 5, 6, are added together, the mean water background level subtracted, and detector offsets balanced.

These ferries are 426 ft. long and 75 ft. wide, and it appears that the wake of the ferries is visible for about 500 ft. on ERTS band 6. The ferry in Fig. 4 is proceeding along the track of the satellite (but in the opposite direction, i.e., roughly northwards). The apparent heading of the ferry (025°) corresponds to its expected course at this point, and it appears that this orientation can probably be measured to $\pm 5^\circ$ or so.

Throughout an ERTS MSS image the rotation of the earth causes a sideways shearing between the sets of six scan lines. At our latitude the correc-

tion needed amounts to about a one pixel sideways shear to the left between each consecutive set of six lines. This has been corrected for in Fig. 4b but not in Figs. 2, 3, and 4a.

5. CALIBRATION DATA ANALYSIS

After every second sweep of the scan mirror, each of the 24 detectors is calibrated by recording its response to a decreasing light source. The apparent radiance of this light source is known at all times during this decay for all 4 bands (Fig. 7), and the corresponding digital numbers can be read from the calibration block (plotted in Fig. 5).

The detector response is recorded as 6 bit data, as in an actual image. Detector output rises steeply from 0 to 63 at the start of calibration and the instant when the output first exceeds 32 is taken as the timing reference (word count 1) for the data. The word count is then a count of the 6 bit numbers from this starting point. After about word count 200, the response decreases slowly from the maximum across the range of possible detector outputs, and the word count can be used to relate the output numbers (plotted in Fig. 5) to the radiance (Fig. 7) during this decay.

On the Canadian September tape the calibration data was found to have some peculiarities and usually appeared as shown in Fig. 6. Some blocks were found not to contain any data. Not all of the calibration 'wedges' went up to 63 (band 7 data never went above 54 and band 4 maxima were sometimes as low as 55), and most blocks contained an unexplained spike before or at the rise in the wedge. The spike was found to be in the same place in all blocks although the actual calibration wedge shifted its position so that its leading edge was sometimes obscured by the spike. A computer program searched for the first word value exceeding 32 after the spike and this word was assigned count 1. If this was the word immediately following the spike, as appeared on some occasions, then the calibration data was rejected. The data also has a slight jitter corresponding to an rms noise level of about 0.5.

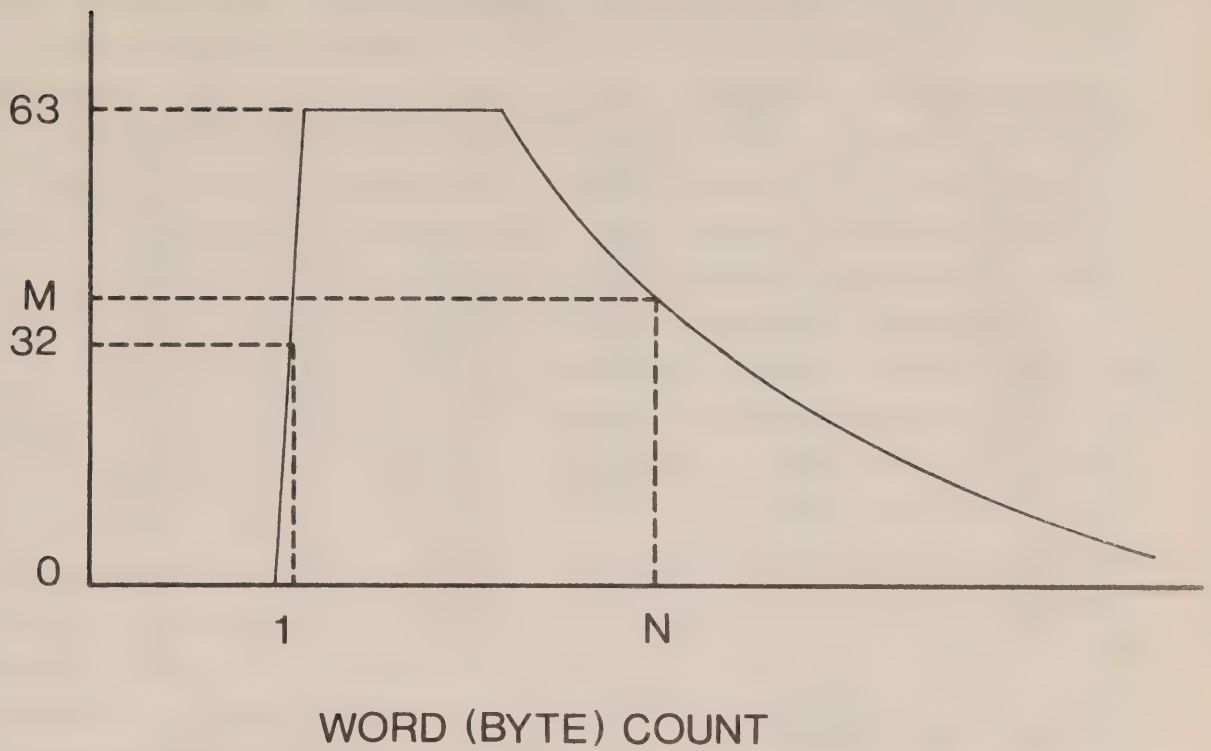


Fig. 5. Plot of nominal calibration wedge

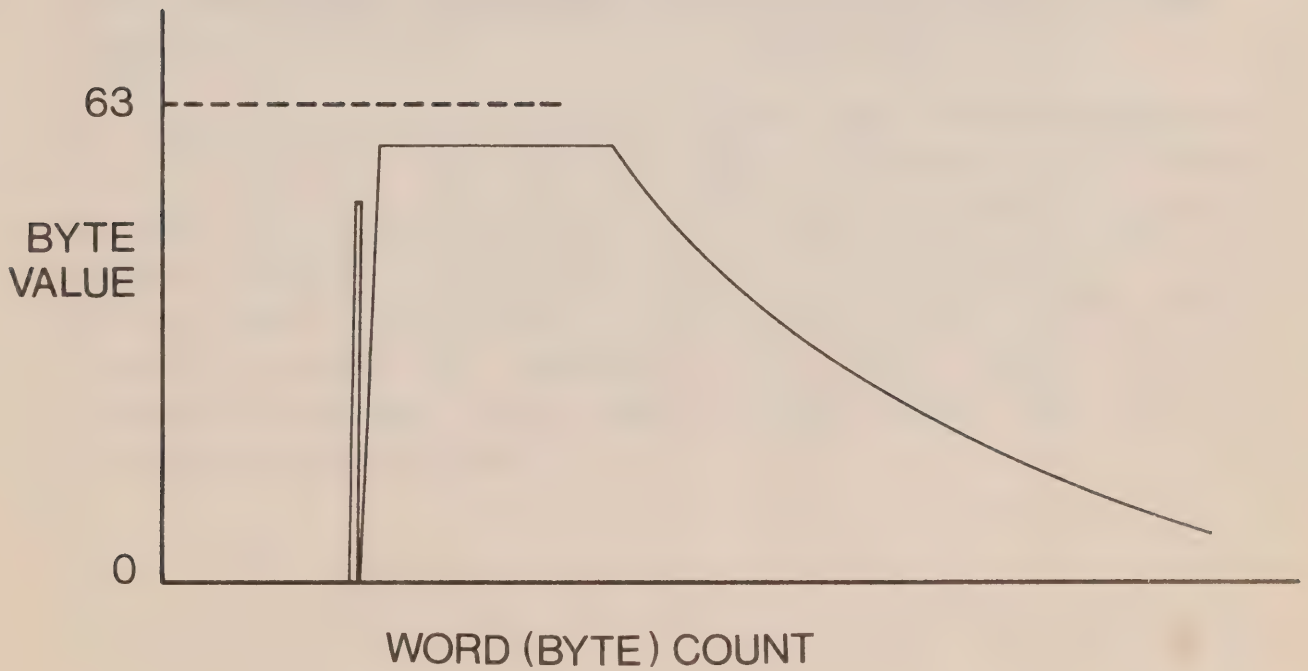


Fig. 6. Plot of calibration wedge as found on Canadian September tape

RADIANCE (10^{-4} W/cm²/st)

<u>WORD COUNT</u>	<u>BAND</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
150		20.0	16.5	13.4	22.4
200		20.0	16.5	13.4	22.4
250		14.0	16.5	13.4	22.4
300		10.2	16.5	13.2	16.8
350		7.3	16.5	10.0	12.0
400		4.9	12.1	7.3	8.2
450		3.3	9.0	5.5	5.7
500		2.3	6.4	4.0	3.7
550		1.3	4.6	3.0	2.2
600		0.75	3.6	2.4	1.5
650		0.40	2.5	1.7	0.75
700		.0	1.8	1.4	.0
750	--	--	1.2	1.2	--
800	--	--	1.0	1.0	--
850	--	--	0.75	0.75	--
900	--	--	0.50	0.70	--

Full Scale Radiance Level: 20, 16.5, 13.4, 22.4 (Low Gain)
6.7, 5.5 (High Gain)

Fig. 7. Radiance values for the calibration wedge in units of 10^{-4} W.cm⁻².steradian⁻¹. All data discussed here was in the low gain mode.

On the Canadian tapes a calibration block, which comes after each set of 24 scan lines (6 lines in 4 bands), contains data from only one detector, and the responses from the other 23 detectors are discarded. Responses from each of the 24 detectors are given in turn, but, since every other calibration block is blank, 48 sweeps of the mirror, or about 3.4 seconds, pass before all detectors have been covered. In a frame - 400 mirror sweeps - there are, therefore, 8 sets of calibration data for each detector. Fig. 8 summarizes the calibration data for detector 1 of band 4 by giving the digital number values averaged over 5 consecutive numbers for the word counts tabulated in Fig. 7 for each of the 8 blocks for this detector on the tape. The calibrations agree to within ± 1 digit (with one exception of 3 digits), and there is no apparent trend with time on this or other detectors. A summarization of all the good data on the tape can therefore be presented as in Fig. 9 by averaging all the trustworthy calibrations for each detector. A similar table for the January 1973 scene, Fig. 10, shows that the calibration has only changed slightly - average detector sensitivity has decreased 3% and the response differences between detectors remains roughly the same. A similar table can be compiled from the more limited calibration data given on the U.S. tape for July 1972 (Fig. 11), and this shows that detector sensitivity was then some 8% higher (assuming constant calibration lamp intensities).

By relating Fig. 7 to Fig. 9, plots of digital number versus radiance can be drawn out (Fig. 12). These plots show that the relationship is not linear and that there are deviations from a smooth curve. Calibration at higher radiances relies on relatively few readings and at low radiances the data does not extend to zero radiance on bands 5 and 6, or below digital numbers 6 and 1.5 on bands 4 and 7 respectively. Band 5 shows a kink at the high radiance end, and band 7 data is clearly strange, and is in fact officially described as 'uncalibrateable'.

WORD COUNT	Radiance ($10^{-4}W/cm^2/st$)	1	2	3	4	5	6	7	8
150	20.0	62	62	62	61	62	62	62	62
200	20.0	62	62	62	62	62	62	62	63
250	14.0	53	51	52	53	53	52	53	54
300	10.2	39	39	39	39	39	39	40	40
350	7.3	33	32	32	32	32	32	32	32
400	4.9	27	27	27	27	27	27	27	27
450	3.3	23	22	23	23	23	23	23	23
500	2.3	18	19	19	18	19	19	19	19
550	1.3	14	14	15	15	15	15	15	15
600	.75	12	11	11	11	11	11	11	12
650	.40	9	8	9	8	9	8	8	8
700	0	6	6	6	6	6	6	6	6
750	-	5	4	4	4	4	4	4	5
800	-	3	3	3	3	3	3	3	3
850	-	2	2	2	2	2	2	2	2
900	-	1	1	2	1	1	2	1	2

Fig. 8. Calibration data summary of each of the 8 blocks for detector 1, band 4.

<u>WORD</u>	<u>BAND 4</u>						<u>BAND 5</u>					
	1	2	3	4	5	6	1	2	3	4	5	6
150	61.7	61.1	59.0	59.8	56.8	61.8	63.0	63.0	63.0	63.0	63.0	63.0
200	61.8	61.2	59.3	60.0	57.0	61.7	63.0	63.0	63.0	63.0	63.0	63.0
250	52.4	52.2	50.7	51.2	48.4	52.6	63.0	63.0	63.0	63.0	63.0	63.0
300	39.2	39.2	38.0	38.5	36.6	39.1	63.0	62.4	63.0	62.9	63.0	63.0
350	32.2	32.4	31.0	31.4	29.7	32.6	54.1	51.1	53.3	51.8	53.7	52.1
400	27.0	27.1	26.2	26.3	25.0	27.2	46.1	43.6	45.4	44.1	45.6	44.3
450	22.7	23.0	22.0	22.1	21.1	23.2	39.5	37.5	39.0	38.0	39.3	38.4
500	18.6	19.1	18.3	17.9	17.1	19.0	33.5	31.3	32.6	31.8	33.0	31.8
550	14.6	15.4	14.6	14.0	13.6	15.3	27.8	25.9	26.8	26.4	27.1	26.5
600	11.3	12.3	11.6	10.9	10.8	12.0	23.3	21.8	22.5	22.1	22.5	21.9
650	8.5	9.4	9.0	8.0	8.1	9.0	19.1	17.5	17.7	17.9	18.1	17.6
700	6.0	7.3	6.7	5.6	6.0	6.9	15.5	14.8	14.0	14.5	14.3	14.1
750	4.3	5.6	5.2	4.1	4.5	5.0	12.8	11.2	11.4	11.9	11.7	11.2
800	3.0	4.4	4.0	3.0	3.1	3.8	10.4	9.1	9.0	9.8	9.1	9.0
850	2.1	3.5	3.1	2.0	2.7	2.8	9.1	7.8	7.5	8.2	7.6	7.9
900	1.4	3.0	2.6	1.9	2.0	2.0	7.1	5.6	5.4	6.4	5.6	5.4

<u>WORD</u>	<u>BAND 6</u>						<u>BAND 7</u>					
	1	2	3	4	5	6	1	2	3	4	5	6
150	63.0	63.0	63.0	63.0	63.0	63.0	52.0	48.3	52.1	44.4	42.2	43.9
200	63.0	63.0	63.0	63.0	63.0	63.0	51.2	47.3	50.7	43.5	42.1	43.6
250	63.0	63.0	63.0	63.0	63.0	63.0	35.4	32.4	34.7	28.9	27.8	28.9
300	62.4	59.7	62.2	53.3	54.8	57.0	20.5	18.6	19.6	16.6	16.1	16.8
350	50.4	48.2	50.3	43.4	44.8	46.4	14.4	13.0	13.4	11.2	10.9	11.3
400	42.7	41.0	42.5	37.1	38.0	39.4	10.5	9.6	9.6	8.1	8.0	8.2
450	36.6	34.6	36.2	30.7	31.6	32.9	8.0	7.2	7.0	5.9	6.0	6.0
500	30.1	28.5	29.8	25.4	26.1	27.0	6.0	5.4	5.0	4.2	4.3	4.4
550	25.2	23.9	24.9	21.0	21.9	22.5	4.7	4.1	3.6	3.0	3.2	3.0
600	21.0	19.8	20.5	17.1	17.8	18.4	3.6	3.1	2.5	2.0	2.3	2.1
650	16.8	15.8	16.4	13.7	13.9	14.5	2.9	2.3	1.8	1.4	1.6	1.6
700	13.6	12.7	13.2	10.6	11.1	11.4	2.0	1.7	1.1	.9	1.1	1.0
750	11.4	10.3	10.6	8.8	9.1	9.3	1.7	1.5	.8	.4	.8	.7
800	9.1	8.3	8.4	6.6	6.9	7.2	1.2	1.0	.5	.2	.7	.4
850	8.4	7.4	7.4	6.1	6.2	6.3	1.1	.8	.5	.1	.5	.0
900	5.9	4.9	5.2	3.4	4.4	4.3	.7	.6	.3	.0	.1	.0

Fig. 9. Averages of all the calibration data on the Canadian September 1972 tape for the 6 detectors in each of the 4 bands.

<u>WORD</u>	<u>BAND 4</u>						<u>BAND 5</u>					
	1	2	3	4	5	6	1	2	3	4	5	6
150	58.8	59.6	57.5	56.8	54.4	60.3	63.0	63.0	63.0	63.0	63.0	63.0
200	58.9	59.7	57.3	56.9	54.3	60.5	63.0	63.0	63.0	63.0	63.0	63.0
250	50.0	50.9	48.8	48.4	46.2	51.3	63.0	63.0	63.0	63.0	63.0	63.0
300	37.6	38.3	36.8	36.5	34.7	38.6	62.9	60.3	62.7	60.7	62.5	61.5
350	30.5	31.3	29.9	29.7	28.2	32.0	51.6	49.3	51.4	49.6	51.1	50.4
400	25.7	26.4	25.4	24.8	23.9	26.8	43.9	42.3	43.7	42.5	43.6	43.0
450	21.5	22.3	21.4	20.8	20.1	22.7	37.9	36.3	37.5	36.6	37.5	36.9
500	17.5	18.3	17.6	16.7	16.1	18.5	31.7	30.1	31.3	30.3	31.0	30.6
550	13.6	14.8	13.7	12.9	12.9	14.8	26.4	25.0	25.9	25.3	25.7	25.6
600	10.7	11.9	11.1	9.9	10.0	11.7	22.2	20.9	21.5	21.1	21.4	21.1
650	7.9	9.1	8.5	7.3	7.6	8.9	17.8	16.6	17.0	16.9	17.0	17.0
700	5.5	7.1	6.3	5.0	5.5	6.7	14.4	13.2	13.2	13.7	13.3	13.4
750	4.0	5.3	5.0	3.8	4.0	4.8	11.9	10.8	10.8	11.1	11.0	10.8
800	2.7	4.1	3.8	2.4	3.0	3.5	9.9	8.8	8.5	9.1	8.4	8.7
850	1.9	3.1	3.1	1.9	2.1	2.7	8.7	7.4	7.2	7.9	7.1	7.3
900	1.1	3.0	2.2	1.2	1.9	2.0	6.5	5.3	5.1	5.9	4.9	5.1

<u>WORD</u>	<u>BAND 6</u>						<u>BAND 7</u>					
	1	2	3	4	5	6	1	2	3	4	5	6
150	63.0	63.0	63.0	63.0	63.0	63.0	50.7	47.0	51.3	43.7	41.9	43.1
200	63.0	63.0	63.0	63.0	63.0	63.0	49.9	46.3	50.1	42.8	41.7	42.7
250	63.0	63.0	63.0	63.0	63.0	63.0	34.3	31.3	34.3	28.4	27.6	28.5
300	62.6	57.7	59.4	52.1	54.2	55.0	20.0	18.1	19.4	16.3	16.0	16.3
350	50.6	46.9	48.1	42.4	44.1	45.0	14.1	12.7	13.0	11.0	10.9	11.1
400	43.1	39.8	40.7	36.0	37.5	38.0	10.3	9.3	9.3	8.0	7.9	8.0
450	36.7	33.4	34.6	29.7	31.1	32.0	7.9	7.1	7.1	5.7	5.8	5.9
500	30.5	27.9	28.4	24.7	25.9	23.0	5.9	5.3	5.1	4.1	4.3	4.1
550	25.2	23.1	23.6	20.3	21.3	22.0	4.4	4.0	3.7	2.9	3.1	3.0
600	21.2	19.1	19.3	16.9	17.4	18.0	3.3	3.0	2.5	2.0	2.2	2.1
650	17.1	15.1	15.5	13.3	13.6	14.0	2.6	2.3	1.8	1.2	1.5	1.5
700	13.9	12.2	12.1	10.5	10.8	11.0	1.9	1.7	1.1	.8	1.1	1.0
750	11.5	10.0	9.8	8.0	8.7	9.0	1.5	1.4	.8	.4	.9	.6
800	9.1	8.0	7.9	6.3	6.9	7.0	1.1	1.0	.4	.2	.5	.3
850	8.3	7.1	7.0	6.3	6.1	6.0	1.1	.9	.1	.0	.3	.1
900	6.0	4.9	4.8	3.7	4.0	4.0	.8	.6	.0	.0	.1	.1

Fig. 10. Averages of all the calibration data on the Canadian January 1973 tape for the six detectors in each of the four bands.

<u>WORD</u>	<u>BAND 4</u>						<u>BAND 5</u>					
	1	2	3	4	5	6	1	2	3	4	5	6
150												
200	57.0	56.0	57.0	56.0	53.0	54.0						
250	49.0	48.0	48.0	49.0	46.0	47.0						
300	42.0	42.0	41.0	42.0	39.0	41.0						
350	36.0	36.0	34.5	35.5	33.0	35.0	58.0	54.0	55.0	55.0	56.0	53.0
400	30.0	30.0	29.0	30.0	27.5	29.5	49.0	46.0	47.0	47.0	48.0	45.0
450	25.0	25.0	24.0	25.0	22.5	25.0	41.0	39.0	39.0	40.0	40.0	39.0
500	20.0	21.0	19.5	20.0	18.5	20.5	35.0	33.0	33.0	34.0	34.0	34.0
550	16.0	16.0	16.0	16.0	15.0	17.0	29.5	28.0	28.0	28.0	28.5	28.0
600	12.5	13.5	13.0	12.5	12.0	13.0	24.5	23.0	23.0	23.5	23.0	23.0
650	9.5	11.0	10.5	9.0	9.5	10.0	20.5	19.0	19.5	19.5	18.5	19.0
700	7.0	8.0	8.0	6.0	7.0	7.5	17.0	15.5	16.0	16.0	15.0	15.5
750	4.5	6.5	6.5	4.5	5.5	5.5	14.5	12.5	13.0	12.5	11.5	12.5
800	3.0	5.0	5.0	3.0	4.0	4.0	11.5	10.0	10.5	10.0	9.0	10.0
850							10.0	8.0	8.5	8.0	6.5	7.5
900							8.0	6.0	7.0	6.0	4.5	5.5

<u>WORD</u>	<u>BAND 6</u>						<u>BAND 7</u>					
	1	2	3	4	5	6	1	2	3	4	5	6
150												
200												
250							41.0	36.0	40.0	34.0	33.0	35.0
300	58.0	55.0	60.0	54.0	55.0	57.0	21.0	20.0	20.0	17.0	17.0	18.0
350	50.0	48.0	52.0	46.0	47.0	49.0						
400	42.5	41.0	44.0	38.0	39.0	40.0						
450	38.0	36.0	37.0	32.0	32.0	33.0						
500	30.0	30.0	31.0	26.5	26.5	28.0	5.0	5.0	3.0	4.0	3.0	4.0
550	25.0	25.0	25.0	22.0	21.5	22.5						
600	21.0	21.0	21.0	18.0	17.5	18.0						
650	17.0	17.0	17.0	14.5	14.5	14.5						
700	14.0	14.0	14.0	11.0	11.0	12.0						
750	11.0	11.5	11.0	10.0	9.0	9.0						
800	8.5	9.0	9.0	7.0	7.0	7.0						
850												
900												

Fig. 11. Calibration data from the U.S. July 1972 tape for comparison with Figs. 10 and 11.

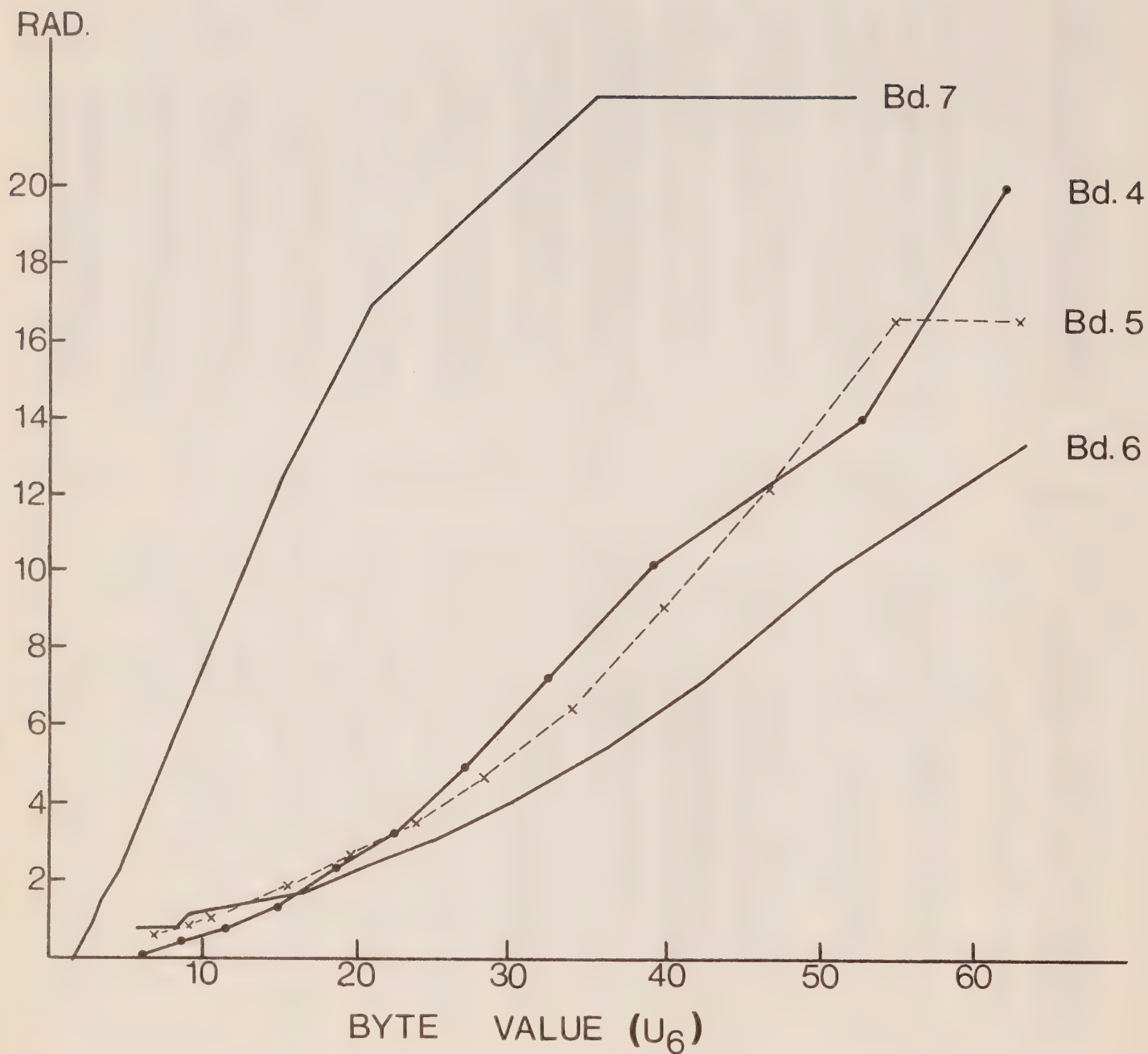


Fig. 12. Plots of byte values versus radiance from the calibration data for the Canadian September 1972 tape. Detector 1 from each band only.

A sample set of 6 consecutive calibration blocks from the U.S. tape is shown in Fig. 13. This set of 6 blocks contains the information that was used in correcting the image data that is on the CCT for all the 24 detectors.

This calibration data contains only six samples from the decay curve of the calibration wedge. These samples are in the 'compressed mode', i.e., the original 6 bit format. They are taken at word counts that vary from band to band as listed in Fig. 14. By interpolating between the six samples, values for many of the word counts given in Fig. 7 were obtained and are listed in Fig. 11 for direct comparison with the Canadian tapes.

The U.S. calibration procedure does not, however, include Fig. 7, but relies instead on decompressing the data to achieve a linear radiance response for each detector and correcting the data for variations in detector gain and sensitivity before writing it into the CCT. Only full scale values for the radiance in each band then need to be known. This will then correspond to 127 in the 7 bit data and other values are calibrated by linear interpolation.

<u>DETECTOR</u>	<u>BAND</u>	<u>WEDGE SAMPLES</u>						<u>K_s</u>	<u>OFFSET</u>	<u>GAIN</u>	<u>LINE LENGTH</u>
1	4	45	42	19	16	7	3	1	-3.27	.875	3220
	5	52	47	24	21	15	11	1	1.29	.944	3220
	6	49	44	38	15	14	11	1	- .35	1.036	3220
	7	41	28	21	6	5	5	1	0	1.000	3220
2	4	45	42	20	16	8	5	1	-1.74	.841	3220
	5	49	44	23	20	13	9	1	.63	.872	3220
	6	47	43	36	16	13	12	1	1.11	.972	3220
	7	36	25	20	6	5	4	1	0	1.000	3220
3	4	44	41	19	16	7	5	1	-2.68	.901	3220
	5	51	46	23	19	13	10	1	- .49	.938	3220
	6	51	45	37	16	14	11	1	- .98	1.137	3220
	7	40	27	20	5	3	4	1	0	1.000	3220
4	4	45	42	19	16	6	3	1	-3.05	.861	3220
	5	50	45	23	21	13	9	1	.32	.943	3220
	6	44	39	32	13	11	10	1	.38	.984	3220
	7	34	23	17	5	4	3	1	0	1.000	3220
5	4	42	39	18	15	7	4	1	-2.04	.811	3220
	5	51	46	22	20	12	8	1	-2.00	.990	3220
	6	45	40	32	13	11	9	1	.57	1.001	3220
	7	33	22	17	4	3	3	1	0	1.000	3220
6	4	44	41	19	17	7	4	1	-1.91	.912	3220
	5	49	45	22	20	13	9	1	- .47	.961	3220
	6	47	42	33	14	12	9	1	-1.32	.988	3220
	7	35	24	18	5	4	4	1	0	1.000	3220

Fig. 13. Six consecutive blocks of calibration data from the U.S. July 30, 1972 tape.

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
BAND 4	280	300	510	550	700	800
BAND 5	380	410	610	640	740	820
BAND 6	360	390	450	670	700	750
BAND 7	250	270	300	500	530	560

Fig. 14. Word counts at which the wedge samples in Fig. 13 were taken.

The decompression look up table (given in Fig. 15) represents the first processing step, transforming 6 bit data values (U_6) into 7 bit values (U_7). The values a_i and b_i in the calibration data block (see Section 3) correspond to the offset and gain of the linearised response for 7 bit data and have been obtained from the decompressed responses in the calibration wedges using regression coefficients given in Goddard publication X-563-73-206. a_i and b_i values are smoothed across effectively 32 consecutive scans and are used to correct the data by calculating:

$$U_7 \text{ (corr)} = K_s \cdot (U_7 - a_i)/b_i$$

The sun calibration coefficient, K_s , would record changes in the on board calibration lamp, by comparing it with the sun's brightness, but has remained at the value 1.000 at least until July 1973.

It is these values of $U_7 \text{ (corr)}$ that appear on the U.S. CCT's.

IN = COMPRESSED OR LINEAR (U_6)

OUT = DECOMPRESSED (U_7)

<u>IN</u>	<u>OUT</u>		<u>IN</u>	<u>OUT</u>		<u>IN</u>	<u>OUT</u>		<u>IN</u>	<u>OUT</u>	
<u>BAND</u>	<u>4,6</u>	<u>5</u>		<u>4,6</u>	<u>5</u>		<u>4,6</u>	<u>5</u>		<u>4,6</u>	<u>5</u>
0	0	0	16	16	16	32	42	41	48	81	80
1	1	1	17	17	17	33	43	43	49	83	83
2	2	2	18	18	18	34	45	45	50	86	86
3	2	2	19	19	19	35	47	47	51	89	88
4	3	3	20	21	21	36	49	49	52	92	91
5	4	4	21	22	22	37	51	51	53	95	94
6	5	5	22	24	23	38	53	52	54	98	97
7	6	6	23	25	23	39	56	53	55	101	100
8	7	7	24	27	27	40	58	58	56	104	104
9	8	8	25	29	28	41	61	60	57	106	107
10	9	9	26	30	30	42	63	63	58	109	109
11	10	10	27	32	32	43	66	66	59	112	112
12	11	11	28	34	34	44	69	69	60	115	115
13	12	12	29	36	36	45	72	71	61	118	117
14	13	13	30	38	38	46	75	74	62	121	120
15	14	14	31	40	39	47	78	77	63	124	122

Fig. 15. Decompression table

Radiance values for this corrected data can now be calculated from

$R = R_{\max} U_7 (\text{corr})/127$ where R_{\max} is 20.0, 16.5, 13.4, and 22.4,

$10^{-4}\text{W/cm}^2/\text{sr}$ for bands 4, 5, 6, 7, respectively. For the data for July 30th this calibration procedure gives for the first detector in each band:

$$\text{Band 4: } R_4 = 0.178 U_7 + .59 \quad 10^{-4}\text{W/cm}^2/\text{sr}$$

$$5: R_5 = 0.138 U_7 - .18 \quad 10^{-4}\text{W/cm}^2/\text{sr}$$

$$6: R_6 = 0.102 U_7 - .04 \quad 10^{-4}\text{W/cm}^2/\text{sr}$$

$$7: R_7 = 0.176 U_7 \quad 10^{-4}\text{W/cm}^2/\text{sr}$$

The two methods of calibrating the July scene are now compared in Figs. 16a and 16b, where radiance values are plotted against U_7 , the decompressed digital numbers. Using the Canadian method, radiance values are related to the U_6 using Figs. 7 and 11, and U_6 is converted to U_7 using the decompression table (Fig. 15). The derived points are plotted as crosses in Figs. 16a and 16b. The linear relations given above between R_4 , R_5 , R_6 , and R_7 and U_7 are plotted as continuous lines. Horizontal dotted lines show the full scale (saturation) radiance values for each band.

Decompression makes the calibration plots roughly linear, though there is still a slight curvature in the relations for each band. The linear relations do not seem to be the best fits to the points, and different values of a_i and b_i would give much better fits.

New regression coefficients have been used after April 1973 and these may have improved the agreement. We cannot say which of the two methods gives the better calibration for band 7. It was difficult to relate the Canadian to the U.S. method for this band, but the general forms can be seen in Figs. 16a and 16b.

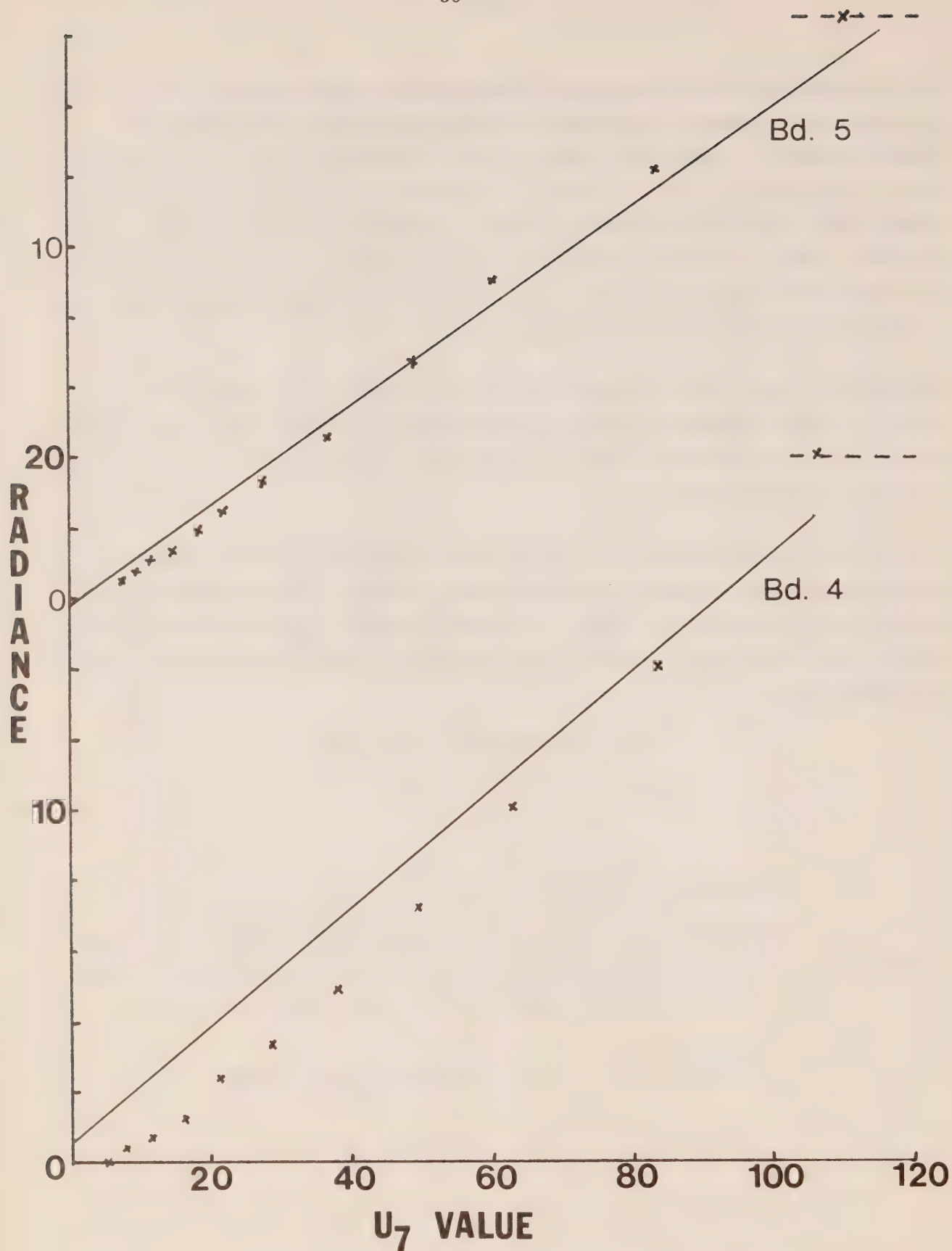


Fig. 16a. Comparison of calibration methods for the U.S. July 1972 tape. Bands 4 and 5.

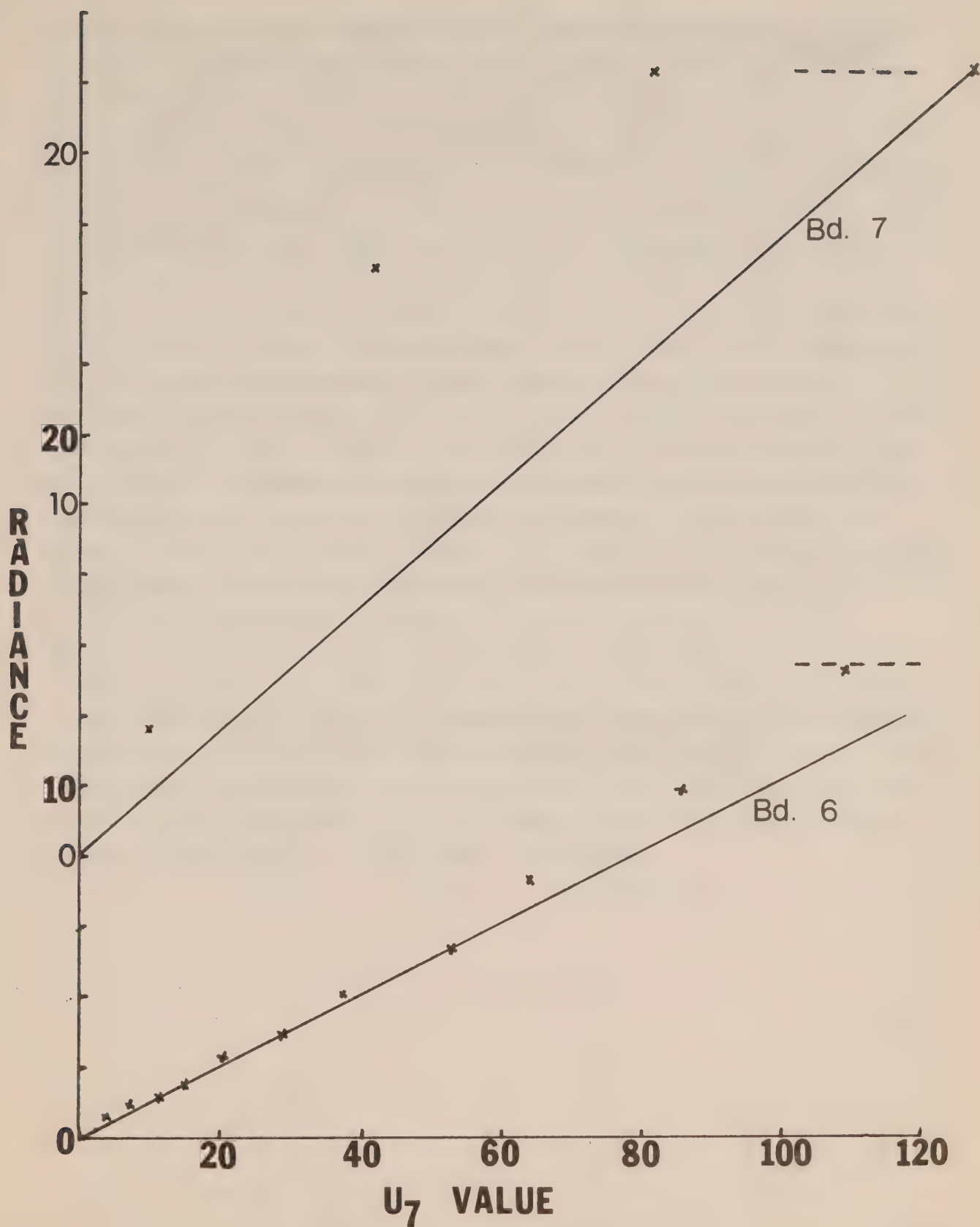


Fig. 16b. Comparison of calibration methods for the U.S. July 1972 tape. Bands 6 and 7.

DETECTOR

1	6	6	6	6	6	6	6	5	5	5	5	6	6
2	5	5	5	5	4	5	5	5	5	5	4	5	5
3	5	6	4	4	5	6	4	5	5	4	5	5	5
4	4	4	4	4	3	4	4	3	4	4	4	4	4
5	5	5	5	5	5	4	5	4	4	4	4	5	4
6	4	3	4	5	4	5	4	4	3	3	4	3	4
1	6	7	6	6	6	5	5	5	5	5	5	5	5
2	5	4	5	5	5	5	4	5	6	5	5	5	5
3	5	5	5	5	5	5	5	4	5	5	4	6	5
4	4	4	3	4	4	4	4	4	4	4	4	4	4
5	4	4	5	4	4	4	5	4	4	4	4	4	4
6	4	4	3	3	4	4	4	3	4	5	4	3	4

Fig. 17. Digital image data from band 6 over a uniform area of water. Detectors #1, 2, 3, show a higher average level than #4, 5, 6.

Although we do not have supporting ground truth radiance measurements at the time of the satellite over-flights, there are still several tests that can show the accuracy and usefulness of the calibration data. One test is to try correcting the stripiness due to sensitivity variations among the individual detectors. These appear on all ERTS MSS images but are particularly visible over large areas of even radiance such as bodies of water. Jumps of approximately 1 or 2 digit steps are found between scan lines on the tape data (Fig. 17). Over water, the jumps can be accurately measured by averaging pixel values along scan lines. The jumps are constant over a scene but change slightly between the three scenes studied. The jumps should be predictable from the calibration data and tests of this for the Canadian September scene over clear water, silty water, and forest, are shown in Figs. 18, 19, and 20. The calibration data does predict the correct form of the stripes and can provide corrections accurate enough to reduce the steps by about a factor 2, even, at low radiances, for band 7. Bands 6 and 7 at higher 'forest' radiances are, however, made worse. The results suggest that calibration accuracy between detectors is accurate to about ± 10 to 20%.

On the United States tape the striping should already have been corrected using the ' a_i ' and ' b_i ' values given in the calibration block. Averaging along scan lines over areas of clear water shows that this is not so, and the correction process has not noticeably decreased the striping. A later set of coefficients for calibrating a_i and b_i is being used after April 1973, and these give some improvement. It still appears that our ad hoc correction provides better results for water than other methods.

DETECTOR		1	2	3	4	5	6	
<u>BAND 4</u> <u>Average</u> <u>Word #</u> <u>584</u>	Observed							
	Average Value	12.2	12.8	12.8	11.8	12.0	13.4	Range = 1.6
	Predicted							
	Average Value	12.3	13.2	12.5	11.8	11.6	12.9	
	Difference	.1	.4	-.3	0	-.4	-.5	Range = .9
<u>BAND 5</u> <u>Average</u> <u>Word #</u> <u>855</u>	Observed							
	Average Value	8.9	7.3	7.2	8.2	7.4	7.7	Range = 1.7
	Predicted							
	Average Value	8.9	7.6	7.3	8.0	7.4	7.6	
	Difference	0	.3	.1	-.2	0	-.1	Range = .5
<u>BAND 6</u> <u>Average</u> <u>Word #</u> <u>906</u>	Observed							
	Average Value	5.6	4.8	4.9	4.0	4.5	4.0	Range = 1.6
	Predicted							
	Average Value	5.9	4.9	5.2	3.4	4.4	4.3	
	Difference	.3	.1	.3	-.6	-.1	.3	Range = .9
<u>BAND 7</u> <u>Average</u> <u>Word #</u> <u>858</u>	Observed							
	Average Value	.9	.9	.2	.1	.6	.3	Range = .8
	Predicted							
	Average Value	1.0	.8	.5	.1	.4	.1	
	Difference	.1	-.1	.3	0	-.2	-.2	Range = .5

Fig. 18. Use of calibration data to predict the difference between average number values for each detector over clear water.

DETECTOR		1	2	3	4	5	6	
<u>BAND 4</u>	Observed							
	Average Value	22.1	22.1	22.4	21.6	21.4	23.8	<u>Range</u> = 2.4
	Predicted							
	Average Value	22.7	23.0	22.0	22.1	21.1	23.2	
<u>Average</u> <u>Word #</u> <u>451</u>	Difference	.6	.9	-.4	.5	-.3	-.6	<u>Range</u> = 1.5
<u>BAND 5</u>	Observed							
	Average Value	17.2	15.3	15.9	16.0	16.2	16.0	<u>Range</u> = 1.9
	Predicted							
	Average Value	17.3	15.8	15.9	16.2	16.2	15.9	
<u>Average</u> <u>Word #</u> <u>676</u>	Difference	.1	.5	0	.2	0	-.1	<u>Range</u> = .6
<u>BAND 6</u>	Observed							
	Average Value	9.4	8.5	9.0	7.7	8.0	7.7	<u>Range</u> = 1.7
	Predicted							
	Average Value	10.0	9.1	9.3	7.5	7.8	8.0	
<u>Average</u> <u>Word #</u> <u>781</u>	Difference	.6	.6	.3	-.2	-.2	.3	<u>Range</u> = .8
<u>BAND 7</u>	Observed							
	Average Value	1.6	1.6	.7	.8	1.0	.8	<u>Range</u> = .9
	Predicted							
	Average Value	1.8	1.5	.9	.5	.9	.8	
<u>Average</u> <u>Word #</u> <u>737</u>	Difference	.2	-.1	.2	-.3	-.1	0	<u>Range</u> = .5

Fig. 19. Use of calibration data to predict the difference between average number values for each detector over silty water.

DETECTOR		1	2	3	4	5	6	
<u>BAND 4</u> <u>Average</u> <u>Word #</u> <u>562</u>	Observed							
	Average value	13.4	14.0	14.3	13.4	13.2	14.9	<u>Range</u> = 1.7
	Predicted							
	Average Value	13.9	14.8	14.0	13.4	13.6	14.6	
	Difference	.5	.8	-.3	0	.4	-.3	<u>Range</u> = 1.1
<u>BAND 5</u> <u>Average</u> <u>Word #</u> <u>780</u>	Observed							
	Average Value	11.2	9.9	10.1	10.6	10.4	9.8	<u>Range</u> = 1.4
	Predicted							
	Average Value	11.4	9.9	10.0	10.6	10.1	9.9	
	Difference	.2	0	-.1	0	-.3	-.1	<u>Range</u> = .5
<u>BAND 6</u> <u>Average</u> <u>Word #</u> <u>478</u>	Observed							
	Average Value	29.8	29.1	33.4	31.6	29.4	28.0	<u>Range</u> = 5.4
	Predicted							
	Average Value	32.7	30.9	32.4	27.5	28.3	29.4	
	Difference	2.9	1.8	-1.0	-4.1	-1.1	1.4	<u>Range</u> = 7.0
<u>BAND 7</u> <u>Average</u> <u>Word #</u> <u>274</u>	Observed							
	Average Value	22.6	24.8	27.3	25.7	24.7	22.9	<u>Range</u> = 4.7
	Predicted							
	Average Value	28.0	25.5	27.2	22.7	22.0	22.8	
	Difference	5.4	.7	-.1	-3.0	-2.7	-.1	<u>Range</u> = 8.4

Fig. 20. Use of calibration data to predict the difference between the average number values for each detector over a forest area.

A further test of calibration data is to see whether it allows the decrease in water radiance due to decreasing sun elevation to be correctly followed. For the September 4 and January 8 scenes, the sun elevations are 43° and 14° respectively. Over a test area of clear water the average digital numbers and the radiances calculated from them varied, as shown in Fig. 21.

<u>SEPTEMBER SCENE</u>			<u>JANUARY SCENE</u>		
<u>Band</u>	<u>Number</u>	<u>Radiance</u>	<u>Number</u>	<u>Radiance</u>	<u>Ratio</u>
4	12.46	1.10	8.10	0.32	3.4
5	7.78	0.79	5.04	0.31	2.6
6	4.63	0.54	3.41	0.40	1.35
7	0.50	0/S	0.39	0/S	--

Fig. 21. Water radiance comparison (September/January)

The expected ratio would be 2.82 for all bands if atmospheric scattering can be neglected and if the water reflectivity is the same on the two dates. Atmospheric scattering would presumably go down in the same ratio if the atmosphere's aerosol content were the same on the two dates. The water area chosen was not near any obvious source of silt. Radiances over water are, however, very low and we are here looking at values less than about 5% of full scale. In fact, on the January scene it appears that the water radiance values reach the limit of the satellite's sensitivity (at least on the standard gain setting). In an area where the water was shaded from the sun by mountains, the drop in averaged U_6 was only from 8.00 to 7.95 on band 4, suggesting that the sensitivity limit of the detectors has been reached.

The calibration data does indicate that a U_6 value of about 6 or 7 in band 4 would correspond to zero radiance, while some radiance must be expected from the atmosphere. It appears that this sensitivity limit will strongly affect water colour measurements at low sun elevations.

6. SIGNATURES OF SILT AND CLOUD

One problem in ERTS-1 imagery interpretation in the black and white photographic format is distinguishing between different targets that give similar reflected radiances. Colour pictures show radiances from three bands simultaneously, but with CCT data it is possible to examine data from all four bands and with greater radiometric and spatial accuracy.

A given target (water, forest, sand, etc.), provided it covers an entire field of view, will have a particular signature, or combination of four radiances recorded in the different ERTS bands. This signature will change with sun angle (i.e., with the season) and atmospheric condition, but stays roughly constant through one scene.

On the September 4 scene of the Vancouver/Victoria area, the land/water classification can be made for cloud-free areas according to band 7 radiance. All pixels covering only land have values greater than about 12 in this band; all pixels covering only water have values less than 3. Pixels containing mixtures of the two have intermediate values (e.g., coastlines, marshes, boats), and these 'edge effects' or mixed targets, limit the way in which pixels can be classified according to their 4 band signature. Such effects are particularly noticeable over land, where resolution is very limited compared to the variety and the spatial structure present in natural and man-made targets. Over water, except for areas within a few hundred feet of shore, the problems are fewer.

We have used the low, band 7 radiance over water to identify 'water' pixels near the coast, in rivers, and in lakes. Water shows as 0, 1, or 2 on the raw data for all three scenes, but ad hoc correction of detector offsets leaves all water either 0 or 1, and gives even greater discrimination against pixels containing some land.

A problem arises, especially in winter when sun elevation is low, since shadows over land also have this low band 7 radiance. The signature of a 'shadow' will depend on what type of target lies in the shadow, but over a variety of backgrounds it resembles that of water quite closely. We mentioned shadow over water in Section 5. In some cases a shadow over forest can be

recognized by its having a lower band 4 value than that for water.

The most important signatures for oceanographic purposes are those of water containing varying types and amounts of silt or other scattering material and of water obscured by varying thicknesses of cloud. On the photographic products the two effects appear identical where thin cloud is concerned. Using taped data, the difference can be recognized by a slight difference in band 7.

If the scene is to be classified pixel by pixel, then the possible sensitivity to 'colour' changes is limited by the relatively coarse digitization into 64 levels. The noise levels of the signals before digitization appears to be just sufficient for this accuracy to be greatly improved by averaging pixels together. In particular, if the 6 readings corresponding to the 6 sensors for each band are averaged, then the different sensor offsets and gains need no longer be considered.

By averaging blocks of 6 by 8 pixels we found the following typical variation of digit values in each band as water silt content (assumed to be indicated by band 4 radiance) increased:

BAND	4	5	6	7
	12.5	7.8	4.6	0.5
	13.8	8.8	5.3	0.6
	16.1	10.7	5.7	0.6
	17.7	12.4	6.5	0.8
	22.2	16.1	8.4	1.1

Fig. 22. Silty water signatures

The final row applies to some of the siltiest water (highest band 4 radiance) present in the scene, but the band 7 radiance has only increased very slightly.

By selecting areas near the fringes of the thick low cloud present on this scene we have arranged a similar sequence for water covered by increasing thicknesses of cloud (again this is assumed to be indicated by the increasing band 4 radiance).

BAND	4	5	6	7
	12.5	7.8	4.6	0.5
	13.7	9.3	6.8	1.1
	14.5	10.6	7.9	1.6
	16.9	13.8	11.3	3.2
	20.0	18.1	15.8	5.1
	24.1	23.3	21.8	8.6
	30.7	31.5	30.1	15.9

Fig. 23. Cloud over water signatures

For thin cloud the band 7 values rise much more rapidly, so that provided an average over a number of pixels can show a measurable rise in all 4 bands, then distinguishing between silty water and thin cloud is possible.

The silt sequence given above is derived from Fraser River silt, and other types would give slightly different results. The important feature - the very small effect on band 7 - is due to the low transparency of water in the infrared, and should not vary significantly.

This use of band 7 to indicate atmospheric effects is extremely necessary and shows how essential an infrared channel would be in a satellite sensor designed for routine water colour measurements. Greater sensitivity in this band would also have been useful for our ERTS data analysis.

Using the two signature sequences in Figs. 22 and 23, we have been able to select clear areas for analysis. In the future such data should allow analysis of larger areas with some automatic atmospheric correction.

7. AREA AVERAGING FOR WATER RADIANCE MEASUREMENTS

One of the most interesting applications of satellite imagery to oceanography is in measuring the rather faint colour changes that may occur over wide areas of water. The colour changes may be due to silt or chlorophyll content of the water, or in some cases may be caused by variations in the wave state of the surface, reflecting different distributions of the sky and sunlight. In shallow water the colour may be affected by the bottom, but except on very gently shelving shores, the resolution of the ERTS satellite is insufficient to allow many useful measurements of this.

Colour changes of water for chlorophyll and hence water productivity estimates (i.e., for plants and hence commercial fishing), would best be measured using a spectrometer covering the blue and blue/green regions of the spectrum where light penetration into water is greatest. Narrower bandwidths than are used on ERTS would also be optimum for this, but bands 4 and 5 should still give some information, especially on variations of received radiance in these bands over a given body of water.

The water colour changes most obviously present on the scenes studied here are due to silty water from the Fraser and other rivers floating out into coastal sea water and moving under the influence of tides and wind. Some effects may be due to chlorophyll, but without an extensive ground truth operation it is difficult to distinguish these. The addition of scattering particles to otherwise clear water causes an increase in radiance observed by the satellite in all four ERTS bands. This increase should be most marked in bands 4 and 5, where light penetrates relatively easily into water. Because of the smaller penetration in the infrared, band 6 shows a very small increase, while band 7 radiance increases even less. This variation is demonstrated in the previous section. In band 4 light penetration into water is greatest, but the contrast in this band is reduced by atmospheric scattering, so that in general band 5 seems to give as good results.

To enhance faint radiance changes in a given band (at the expense of spatial resolution) a number of pixel values can be averaged together. To avoid the problems already mentioned caused by response variations among the 6 sensing

elements in one band, this averaging should be across multiples of 6 scan lines. For roughly square areas to be averaged, the averaging in the other dimension should be in multiples of 8 pixels (more exactly, 8.2). Averaging groups of pixels also allows more accurate signatures to be used, especially when detecting atmospheric effects.

For processing water areas near land, the pixel values in band 7 were checked to see that these had the low radiance corresponding to water. Only such pixels were included in the average, and the area was rejected if less than a certain fraction of the pixels met this criterion.

In Fig. 24 the computer has printed pixel averages in band 4 for the area of Howe Sound. If less than 50% of the pixels in a given area appeared to be water on the basis of band 7 radiance, a zero is shown, otherwise the numbers represent 100 times the average value (of U_6) in an area 24 by 32 pixels (roughly 1 nautical mile square). The greatly increased radiance at the north end of the inlet is due to silt entering from the Squamish River. In the southeast corner, silt from the Fraser River is carried in from the Georgia Strait and the relative magnitude of the other band 4 radiances reflects the circulation of these two bodies of silty water in the Sound.

0	0	0	0	0	0	0	0	0	0	2188	2214	0	0	0
0	0	0	0	0	0	0	0	0	2104	0	0	0	0	0
0	0	0	0	0	0	0	0	0	2074	1840	0	0	0	0
0	0	0	0	0	0	0	0	0	0	1993	0	0	0	0
0	0	0	0	0	0	0	0	0	0	1993	0	0	0	0
0	0	0	0	0	0	0	0	0	0	1891	0	0	0	0
0	0	0	0	0	0	0	0	0	1656	1771	1734	0	0	0
0	0	0	0	0	0	0	0	0	1448	1598	1648	1478	0	0
0	0	0	0	0	1305	1357	1341	0	0	1347	0	0	0	0
0	0	0	0	1240	1242	1252	1273	1290	0	1342	0	0	0	0
0	0	0	1190	1187	0	0	0	1306	1346	1351	1332	0	0	0
0	0	0	1186	0	0	0	0	0	1355	1354	1341	0	0	0
0	0	0	1196	1187	0	0	0	0	0	1352	1328	1330	0	0
0	0	0	0	1209	0	0	0	0	0	1336	1354	1375	0	0
0	0	0	0	1274	0	1275	1260	0	1304	1345	1427	1403	1393	0
0	0	0	0	0	1280	1289	1277	1289	1288	1317	1426	1461	1407	0
0	0	0	0	0	1289	1298	1282	1284	0	0	1482	1489	1416	0
0	0	0	0	1287	0	0	1280	0	0	0	1511	1473	0	0
0	0	0	0	1306	1301	1297	1281	0	0	0	1564	1492	0	0
1360	1346	1328	1341	1305	1297	1317	1303	0	0	0	1648	1598	1476	0
1379	1379	1379	1385	1368	1372	1401	1355	0	0	1576	1662	1753	1725	1616
1316	1325	1332	1344	1343	1340	1371	1417	1462	1487	1507	1567	1726	1854	1806

Fig. 24. Howe Sound. Averages of digital values over blocks 24 by 32 pixels, for band 4 (x 100). Land areas shown by zeros.

Fig. 25 shows a small area of Salmon Inlet in band 4 with radiances averaged over 6 by 8 pixels equivalent to an area roughly 1/4 mile square. Here the total variation of radiance is much less, but there appears to be a significant trend across the inlet. This change is from about 11.80 to 12.30 in digital numbers and represents a radiance difference from about 1.04 to $1.13 \cdot 10^{-4} \text{ W/cm}^2/\text{sr}$.

This change could be due to atmospheric effects or differences in surface reflection caused by variations in wavestate, or by a variation in water colour. Examination of the equivalent band 7 data shows variations that, in conjunction with the 'cloud' and 'silt' signatures developed in the previous section, suggest that some, but not all, of this variation may be due to atmospheric changes. Unfortunately, the signal to noise ratio of the band 7 data (the signal level is very low over water), makes this distinction difficult. The band 7 data also contains small errors that affect the analysis.

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	1195	1193	1204
0	0	0	0	0	0	0	0	0	0	1166	1197	1193	1187	1183
0	0	0	0	0	0	0	0	1192	1212	1200	1193	1181	1177	1176
0	0	0	0	0	0	0	1217	1210	1220	1191	1202	1200	0	0
0	0	0	0	0	1207	1240	1218	1202	1195	1185	1137	0	0	0
0	0	0	1247	1231	1222	1220	1231	1202	1189	1170	1106	0	0	0
0	0	1243	1225	1229	1229	1222	1220	1187	1187	1188	0	0	0	0
1240	1229	1212	1200	1208	1218	1214	1202	1185	1197	0	0	0	0	0
1229	1225	1214	1208	1202	1185	1185	1202	0	0	0	0	0	0	0
1254	1241	1216	1208	1202	1168	1206	0	0	0	0	0	0	0	0
1272	1252	1237	1200	1189	1195	0	0	0	0	0	0	0	0	0
1266	1252	1237	1191	1183	1191	0	0	0	0	0	0	0	0	0
1260	1256	1237	1191	1182	0	0	0	0	0	0	0	0	0	0

Fig. 25. Salmon Inlet. Averages of digital values over blocks 6 by 8 pixels, for band 4 (x 100). Land areas shown by zeros.

When the whole area of the inlet is examined in band 4, the radiance variations shown in Fig. 26 are found. Here the areas of increasing darkness on the picture indicate increased average band 4 radiance. The same side to side variation in apparent radiance shown in the previous figure is found to extend over a larger area. If the variations are due to water colour changes then it is interesting that they would reflect the theoretical form of water circulation in an inlet in the northern hemisphere with fresh run-off water and its load of silt moving towards the sea down the right hand side.

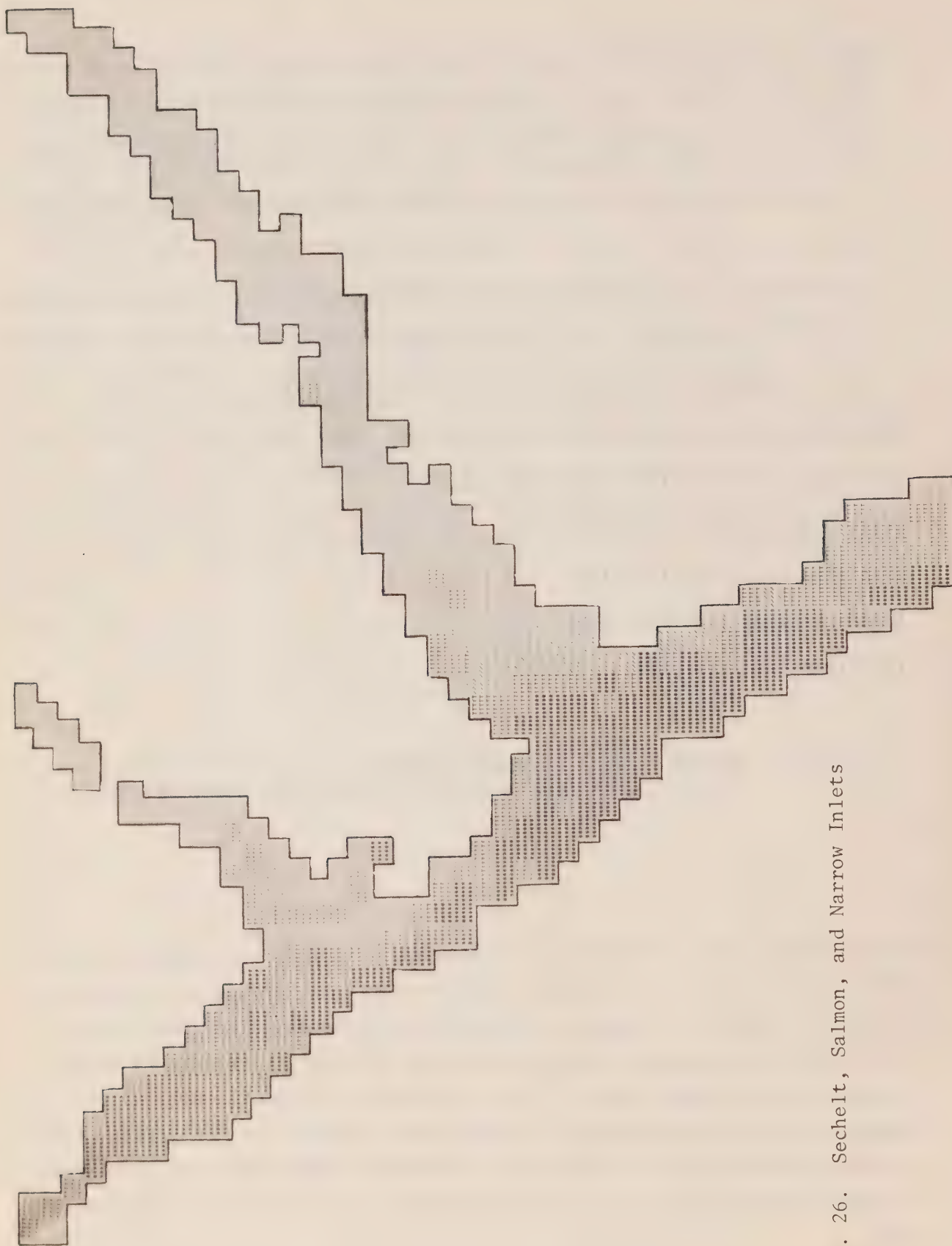


Fig. 26. Sechelt, Salmon, and Narrow Inlets

Fig. 27 shows the result of extending this same type of analysis over a large area of the Strait of Georgia as imaged on the September scene. The band 4 radiance contours are based on averages over 24 by 32 pixels and show up the variations of Fraser River silt content of the sea's surface layer.

The contours show the form of the plume in the areas where its effect is very marked, and the intervals are also chosen to show faint effects over a much larger area. In this way a tongue of silt laden water can be seen extending to the northeast along the north edge of the Strait.

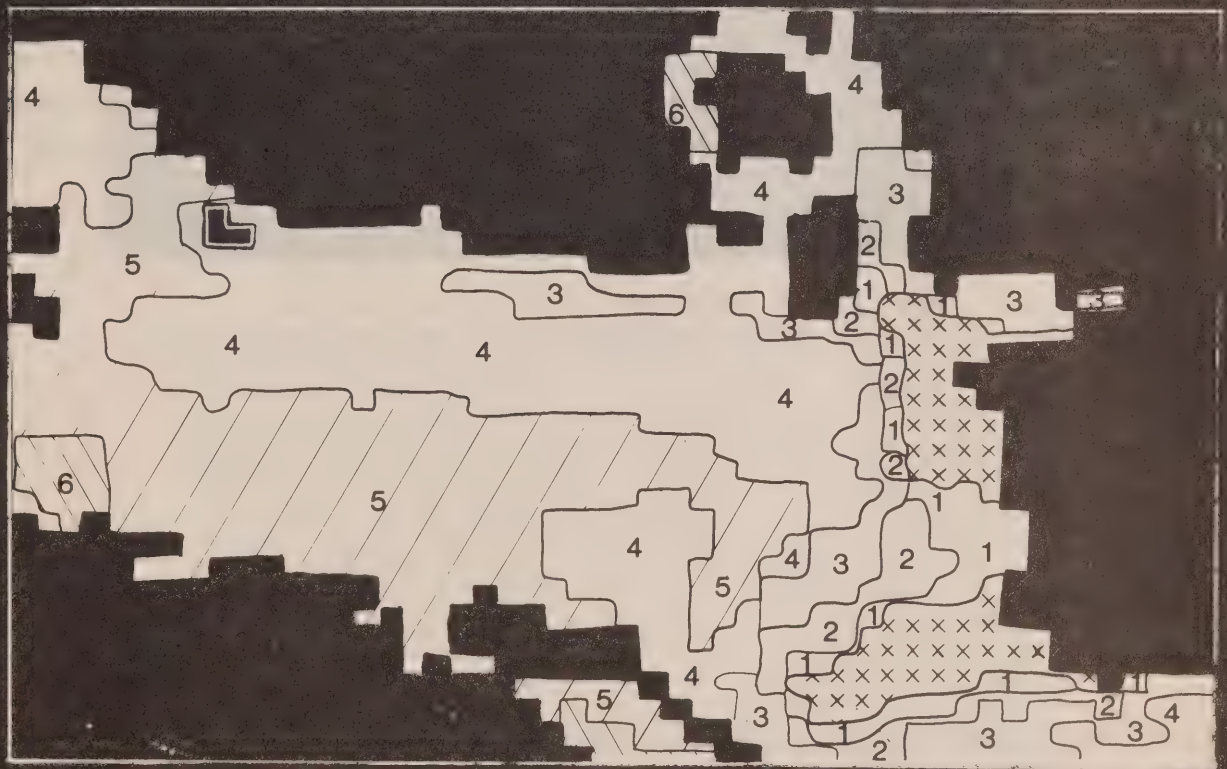


Fig. 27. Fraser River silt distribution in the Strait of Georgia

Density enhancement of the ERTS image transparencies using a TV image slicing system shows these same features. The computer data must have the greatest sensitivity to density variations and also permit several bands to be examined at once, but the TV systems provide a rapid first look at this data and have a great advantage in providing an easily visible display of the

final product. Fig. 28 shows such an enhancement of the same area of the Strait of Georgia on which the same features can be seen.

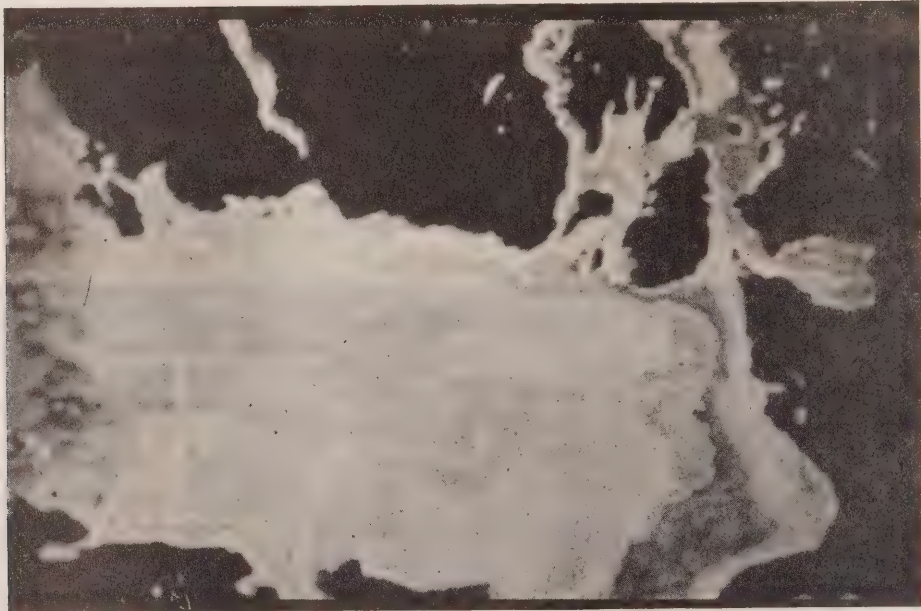


Fig. 28. Enhancement of Strait of Georgia using a television density slicer.

Figs. 29a and 29b are photographs of ERTS digital data as displayed on a 2000 spot per line oscilloscope belonging to the Electrical Engineering Department of the University of British Columbia. The oscilloscope is interfaced to a mini-computer and can display digital data read from a magnetic tape unit. Pixel values in adjacent areas, measuring 6 by 8 pixels, were averaged over all the September scene. The averaged picture then has 400 x 400 elements with reduced spatial resolution, but much higher radiance resolution. Since the averaging was over sets of 6 detectors, no striping is present on the final image. Data from band 7 was used to black out land and cloud covered

areas where more than 50% of the pixels exceeded a threshold U_6 value of 3. The final digital picture was written onto tape in a format compatible with the University of British Columbia system with the radiance values spread across the 2048 different levels that are accepted by the digital to analog converter at the oscilloscope's spot intensity input. The oscilloscope screen is photographed using a long time exposure (approximately 2 minutes) to cover the total image scan.

Figs. 29a and 29b show averages of bands 4 and 6 respectively. The Fraser River and its plume in the Strait of Georgia, the north end of Howe Sound, and some of the lakes, show high radiance due to the river silt present. The small bright patches at the west end of the Fraser River plume show best on band 6, and band 7 data confirms that they are clouds in the atmosphere. Most other features seem related to water colour variations but atmospheric effects need to be studied further.

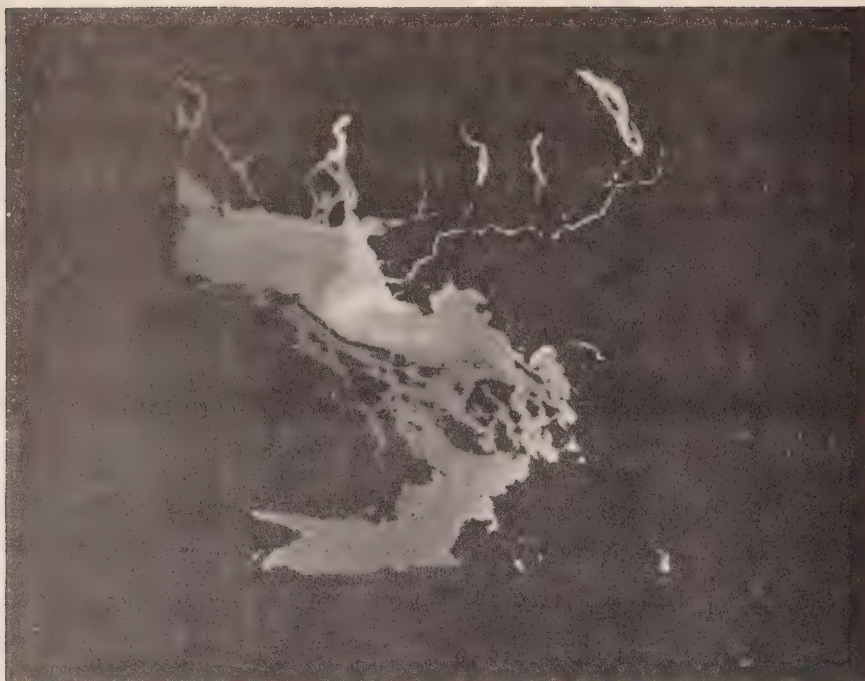


Fig. 29a. Band 4, Strait of Georgia



Fig. 29b. Band 6, Strait of Georgia

8. USER ORIENTED COMPUTER PROGRAMS

A fairly extensive library of programs has been written to examine and display various aspects of both Canadian and American produced ERTS-1 computer tapes. Listed below are four sample programs which could be of interest to groups who want certain tapes analysed or who wish to start their own computer study of the tapes.

All programs are designed to run on an H-P 16K 2116 series computer with 9 track tape drive and VERSATEC 80 char./line line printer. The ERTS COPY program needs two 9 track tape drives but can be run on an 8K H-P computer.

1. ERTS COPY

A program to translate the 6 bit/byte packed format of the CCT's provided by the Canada Centre for Remote Sensing, into an 8 bit/byte form. The bands are also registered at this time for future programs which call for interaction between bands.

Approximate running time: 40 minutes per scene (100 nautical miles square).

2. STRPD

A program to pick out chosen areas from a scene and represent them as digits in a geographically oriented format on the line printer. Operator has choice of bands, and an option to apply detector corrections in this program.

Approximate running time: 3 minutes per 100 scans, 72 pixels wide.

3. DIODE

A program to summarize all the calibration blocks on tape into a table from which one can compare the digit value of all bands separately to the radiance value in ($10^{-4} \text{ W/cm}^2/\text{sr}$).

Approximate running time: 40 minutes per scene.

4. AVRGE

A program that uses a threshold number in one band to choose numbers from other bands, group them, and give an average value for the group. Prints out 0 if less than a chosen percentage of the group is below the threshold. Can be used to display anything one knows the digit signature for, i.e., clear water, silty water, clouds, snow, forest, etc. The output is either a printed geographically oriented average number for each group or a shading effect using different printer character densities.

9. CONCLUSIONS

We have found that ERTS data can be analysed quickly and in a variety of ways using a small computer.

The computing often involved simple repetitive processing of a large volume of data. For this the small computer was cheaper and still relatively convenient as compared to a large facility, e.g., IBM 360.

The programs described here have allowed us to:

- (a) display the numerical radiance values sent down by the satellite and so become acquainted with the range, signal to noise ratio, and statistics generally of the signal from various targets,
- (b) read out the calibration data to give a conversion to absolute units and to assure ourselves of its constancy with time,
- (c) correct the data for differences in detector sensitivity and offset,
- (d) average groups of pixel values to achieve much greater radiance sensitivity at the expense of spatial resolution, and
- (e) use the data from more than one band simultaneously for signature recognition.

This final task will, in future, be performed much more conveniently by special purpose processors like the General Electric Image 100 system, but such systems are not designed for several of the other tasks listed above, nor do they have the flexibility for a large number of other processes such as image filtering, and geometrical correction for investigating changes between images taken on different dates.

Most of the output produced in this work could be adequately displayed as numbers on our line printer, but in many ways a more visual display is useful. Other types of image processing (geometrical correction or filtering) would need an output device such as the high resolution, white phosphor stable oscilloscope, described in Section 7.

In our discussion of tape formats we note that the Canadian tapes would be more convenient for use if (a) the layout made use of 8 bit bytes, and (b) the calibration data were pre-processed to a more compact form. In those respects it would then follow the U.S. format, while keeping to its smaller number of tapes per image.

AI EP 321

-74R03

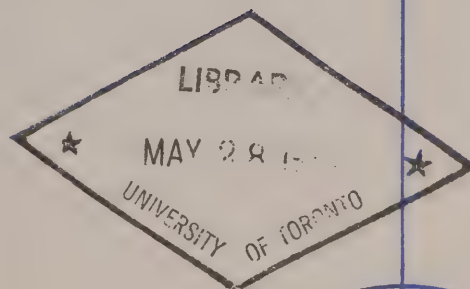
**OCEANOGRAPHIC OBSERVATIONS AT
OCEAN STATION P (50°N, 145°W)**

Volume 56

January 5 - May 16, 1973

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MARINE SCIENCES DIRECTORATE, PACIFIC REGION

PACIFIC MARINE SCIENCE REPORT 74-3

OCEANOGRAPHIC OBSERVATIONS AT OCEAN STATION P (50°N, 145°W)

VOLUME 56

JANUARY 5 - MAY 16, 1973

by

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Victoria, B.C.
Marine Sciences Directorate, Pacific Region
Environment Canada
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This is a manuscript which has received only limited circulation. On citing this report in a bibliography, the title should be followed by the words "UNPUBLISHED MANUSCRIPT" which is in accordance with accepted bibliographic custom.

INTRODUCTION

Canadian operation of Ocean Weather Station P (latitude 50°00'N, longitude 145°00'W) was inaugurated in December, 1950. The station is occupied primarily to make meteorological observations of the surface and upper air and to provide an air-sea rescue service. The station is manned by two vessels operated by the Marine Services Branch of the Ministry of Transport. They are the CCGS Vancouver and the CCGS Quadra. Each ship remains on station for a period of six weeks, and is then relieved by the alternate ship, thus maintaining a continuous watch.

Bathythermograph observations have been made at Station P since July, 1952. A program of more extensive oceanographic observations was commenced in August, 1956. This was further extended in April, 1959, by the addition of a series of oceanographic stations along the route to and from Station P and Swiftsure Bank. These stations are known as Line P stations. The number of stations on Line P has been increased twice and now consists of twelve stations (Fig. 1). Bathythermograph observations and surface salinity sample collections in addition to being made on Line P oceanographic stations are also made at odd meridians at 40' i.e., 139°40'W, 141°40'W, etc. These stations are known as Line P BT stations. Data observed prior to 1968 has been indexed by Collins et al, (1969).

The present record includes hydrographic and continuously sampled STD data collected from the CCGS Vancouver during the period January 5 to February 21, 1973, surface temperature and salinity data collected from the CCGS Quadra during the period February 16 to April 4, 1973, and hydrographic and continuously sampled STD data collected from the CCGS Vancouver during the period March 30 to May 16, 1973.

All physical oceanographic data have been stored by the Canadian Oceanographic Data Centre (CODC), 615 Booth Street, Ottawa, Ontario, Canada. Requests for these data should be directed to CODC.

Biological and productivity data are published in the Manuscript Report series of the Fisheries Research Board of Canada (FRB), the Biological Station, Nanaimo, B.C., Canada. Requests for these data should be directed to FRB.

Marine geochemical data are for the Ocean Chemistry Group, Marine Sciences Directorate, Department of the Environment, 512-1230 Government St., Victoria, B.C., Canada.

Bird observations are sent to Dr. M. Myres, University of Calgary, Calgary, Alberta, Canada; and marine mammal observations to Mr. I. McAskie, Fisheries Research Board of Canada, the Biological Station, Nanaimo, B.C., Canada.

Programme of Observations from CCGS Vancouver, January 5 to February 21, 1973. (P-73-1) (CODC Ref. No. 15-73-001)

Oceanographic observations were made by Mr. C. Jackson, Marine Sciences Directorate, Department of the Environment.

En route to Station P, Stations 1 to 12 were occupied and a STD profile made to near bottom or 1500 metres. Mechanical BT or XBT's were taken at all hydrographic and BT stations on Line P. The surface temperature recorder was run continuously. Surface salinity and nitrate samples were also collected at all stations.

At Station P the oceanographic programme was carried out as follows:

I) Physical Oceanography

- 1) Profiles of salinity; temperature and oxygen were obtained from weekly hydrographic stations to near bottom (4200 metres).
- 2) STD profiles to 1500 metres following the hydrographic stations.
- 3) STD profiles to 300 metres between the hydrographic stations.
- 4) Mechanical BT's were taken every 3 hours to coincide with meteorological observations, encoded and transmitted according to the IGOSS format.
- 5) The surface temperature recorder was run continuously for approximately one half hour before, during, and one half hour after all hydrographic and STD stations.
- 6) Surface salinity daily at 0000 hrs. GMT from the seawater loop.

II) Biological and Productivity

Samples were obtained as follows:

- 1) Plankton
A total of 5-150 metre, 2-1200 metre vertical plankton hauls, 12-10 minute horizontal surface tows and daily micro-organism samples from the seawater loop.
- 2) Three profiles and three surface samples were taken for plant pigment, nitrate and C-14 productivity.
- 3) Weekly secchi disk depth measurements.
- 4) The high frequency echo sounder was run for 4 hours daily from 0900-1100 hrs. local time and for one hour before and after sunset.
- 5) Four large carboys of bucket surface sample were obtained.
- 6) Fish heads and tails were obtained and frozen. A total of about 100 salmon were caught in the fishing programme.

III) Marine Geochemistry

Samples were obtained as follows:

- 1) Oxygen samples were taken from all hydrographic stations plus a sample from the seawater loop every 3 days at 0000 GMT.
- 2) Alkalinity sample every 3 days from the seawater loop at 0000 GMT.
- 3) Nutrient samples daily from the loop at 0000 GMT along with seawater loop salinity and bucket temperature, plus hourly sampling for one 24 hour period.
- 4) Air CO₂ samples in duplicate weekly.
- 5) Surface phosphate and silicate samples daily from the seawater loop.

IV) Marine Mammal, Bird and Data for Other Institutes

- 1) Marine mammal and bird observations were recorded.
- 2) Rainwater and sea surface samples were collected for Scripps Institution of Oceanography.
- 3) Scripps Institution buoy observations and films were made by the ship's officers.
- 4) Five tar ball tows were made on station and two at Stations 4 and 3 inbound for Mr. D. Green, Ph.D. graduate student, University of British Columbia.

En route from Station P all stations were occupied except Nos. 12 and 7, which were missed due to bad weather. STD profiles to 1500 metres or near bottom. Mechanical BT or XBT's were taken at all hydrographic and BT stations except 11A. Salinity samples and surface temperatures were taken at all stations except 11A.

Programme of Observations from CCGS Quadra, February 16 to April 4, 1973
(P-73-2) (CODC Ref. No. 15-73-002)

Oceanographic observations were made by the ship's officers.

En route to Station P, Quadra sailed via Cobb Seamount to take a comparison wave recording reading with the wave recorder on the Seamount. BT's and salinity samples were taken at locations on the same longitude as the regular Line P stations.

At Station P the oceanographic programme was carried out as follows:

I) Physical Oceanography

- 1) Mechanical BT's were taken every 3 hours to coincide with meteorological observations, encoded and transmitted according to the IGOSS format.
- 2) Surface salinity samples daily at 0000 hrs. GMT.

II) Biological and Productivity

- 1) Nitrate samples weekly from the seawater loop.
- 2) Two frozen whole salmon from the fishing programme.
- 3) High frequency echo soundings twice daily.

III) Marine Geochemistry

- 1) Surface nutrient and alkalinity samples were taken.
- 2) Air CO₂ samples in duplicate weekly.

IV) Marine Mammal, Bird and Data for Other Institutes

- 1) Marine mammal and bird observations were recorded.
- 2) Observations of Scripps Institution buoy were made.

En route from Station P, BT's were taken, surface salinity samples collected, and the surface temperature recorder and thermosalinograph were run continuously.

Programme of Observations from CCGS Vancouver, March 30 to May 16, 1973
(P-73-3) (CODC Ref. No. 15-73-003)

Oceanographic observations were made by Mr. W. Hansen, Marine Sciences Directorate, Department of the Environment.

En route to Station P all stations except 9 and 10 were occupied and a STD profile made to near bottom or 1500 metres. Mechanical BT or XBT's were taken at all stations. Salinity and nitrate samples were taken from the seawater loop. Six tar ball tows were made.

At Station P the oceanographic programme was carried out as follows:

I) Physical Oceanography

- 1) Profiles of salinity, temperature, and oxygen were obtained from weekly hydrographic stations to near bottom (4200 metres).
- 2) STD profiles to 1500 metres following the hydrographic stations.
- 3) STD profiles to 300 metres between the hydrographic stations.
- 4) Mechanical BT's were taken every 3 hours to coincide with meteorological observations, encoded and transmitted according to the IGOSS format.
- 5) Surface salinity daily at 0000 hrs. GMT from the seawater loop.

II) Biological and Productivity

Samples were obtained as follows:

- 1) Plankton
A total of 23-150 metre vertical hauls and 9-10 minute horizontal tows. Micro-organisms sampled daily from the seawater loop.
- 2) Two profiles for plant pigment and C-14 productivity.
- 3) Three secchi disk depth measurements.

III) Marine Geochemistry

Samples were obtained as follows:

- 1) Oxygen samples were taken from all hydrographic stations.
- 2) Nutrient, phosphate and salinity samples daily at 0000 hrs. GMT plus hourly sampling for one 24 hour period from the seawater loop.
- 3) Alkalinity samples every 3 days from the seawater loop.
- 4) Two surface water $C^{14}O_2$ samples were taken.
- 5) Air CO_2 samples in duplicate weekly.
- 6) Eight tar ball tows were made.

IV) Marine Mammal, Bird and Data for Other Institutes

- 1) Marine mammal and bird observations were recorded.

En route from station, CCGS Vancouver was detoured south of Line P on a rescue mission. The ship rejoined Line P at Station 6. Stations 6 to 2 were occupied and a STD profile to 1500 metres or near bottom made. BT's were taken and surface salinities and nitrates were obtained at these stations. The surface temperature recorder was run continuously on the rescue mission and on Line P.

Data was processed by Messrs. C. de Jong, W. Hansen, B. Minkley, and E. Luscombe, and assembled and edited for publication by Mr. K. Abbott-Smith.

Observational Procedures

Temperatures at depth were measured by deep-sea reversing thermometers of German (Richter and Wiese) or Japanese (Yoshino Keiki Co.) manufacture. Two protected thermometers were used on all Nansen bottles, and one unprotected thermometer was used on each bottle at depths of 300 m or greater. The accuracy of protected reversing thermometers is believed to be $\pm 0.02^\circ C$.

Surface water temperatures were measured from a bucket sample using a deck thermometer of $\pm 0.1^\circ C$ accuracy.

Salinity determinations were made aboard ship with either an Auto-Lab Model 601 Mark 111 inductive salinometer or a Hytech Model 6220 lab salinometer. Accuracy using duplicate determinations is estimated to be ± 0.003 ppt.

Depth determinations were made using the "depth difference" method described in the U.S.N. Hydrographic Office Publication No. 607 (1955). Depth estimates have an approximate accuracy of ± 5 m for depths less than 1000 m, and $\pm 0.5\%$ of depth for depths greater than 1000 m.

The dissolved oxygen analyses were done in the shipboard laboratory by a modified Winkler method (Carpenter, 1965).

Line P engine intake continuous temperatures on both ships were recorded by a Honeywell Model 15303836 Recorder. The temperature probe is at a depth of approximately 3 metres below the sea surface and the instrument accuracy is believed to be $\pm 0.1^\circ\text{C}$.

CCGS Quadra is equipped with a Bissett Berman Model 6600-T thermosalinograph which is used, on Line P, for continuous recording of surface temperatures and salinities from the ship's seawater loop. The temperature probe is mounted at the seawater loop intake (approximately 3 metres below the surface) and the salinity probe and recorder is situated in the dry lab. The accuracy of this instrument is believed to be $\pm 0.1^\circ\text{C}$ for temperature and ± 0.1 ppt for salinity.

Computations

All hydrographic data were processed with the aid of an IBM 360 computer. Reversing thermometer temperature corrections, thermometric depth calculations, and accepted depth from the "depth difference" method were computed. Extraneous thermometric depths caused by thermometer malfunctions are automatically edited and replaced. A Calcomp 565 Offline Plotter was used to plot temperature-salinity and temperature-oxygen diagrams, as well as plots of temperature, salinity and dissolved oxygen vs \log_{10} depth. These plots were used to check the data for errors.

Missing hydrographic data were obtained using a weighted parabolae interpolation method (Reiniger and Ross, 1968). These data are indicated with an asterisk in this data record.

Data values which we suspect but which we have included in this data record are indicated with a plus. These data have been removed from punch card and magnetic tape records.

Analog records from the salinity-temperature-pressure instrument have been machine digitized, then replotted using the Calcomp Plotter.

Digitization was continued until original and computer plotted traces were coincident. Temperature and salinity values were listed at standard pressures; integrals (depths, geopotential anomaly, and potential energy anomaly) were computed from the entire array of digitized data.

The headings for the data listings are explained as follows:

PRESS	is pressure (decibars)
TEMP	is temperature (degrees Celsius)
SAL	is salinity (parts per thousand)
DEPTH	is reported in metres
SIGMA-T	is specific gravity anomaly
SVA	is specific volume anomaly
THETA	is potential temperature (degrees Celsius)
SVA (THETA)	is potential specific volume anomaly
DELTA D	is geopotential anomaly (J/kg)
POT EN	is potential energy in units of 10^8 ergs/cm ²
OXY	is the concentration of dissolved oxygen expressed in millilitres per litre
B-V PERIOD	is the Brunt-Vaisala period in minutes

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- Reiniger, R.F., and C.K. Ross. 1968. A method of interpolation with application to oceanographic data. *Deep Sea Res.*, 15: 185-193.
- U.S.N. Hydrographic Office. 1955. Instruction manual for oceanographic observations, Publ. no. 607.

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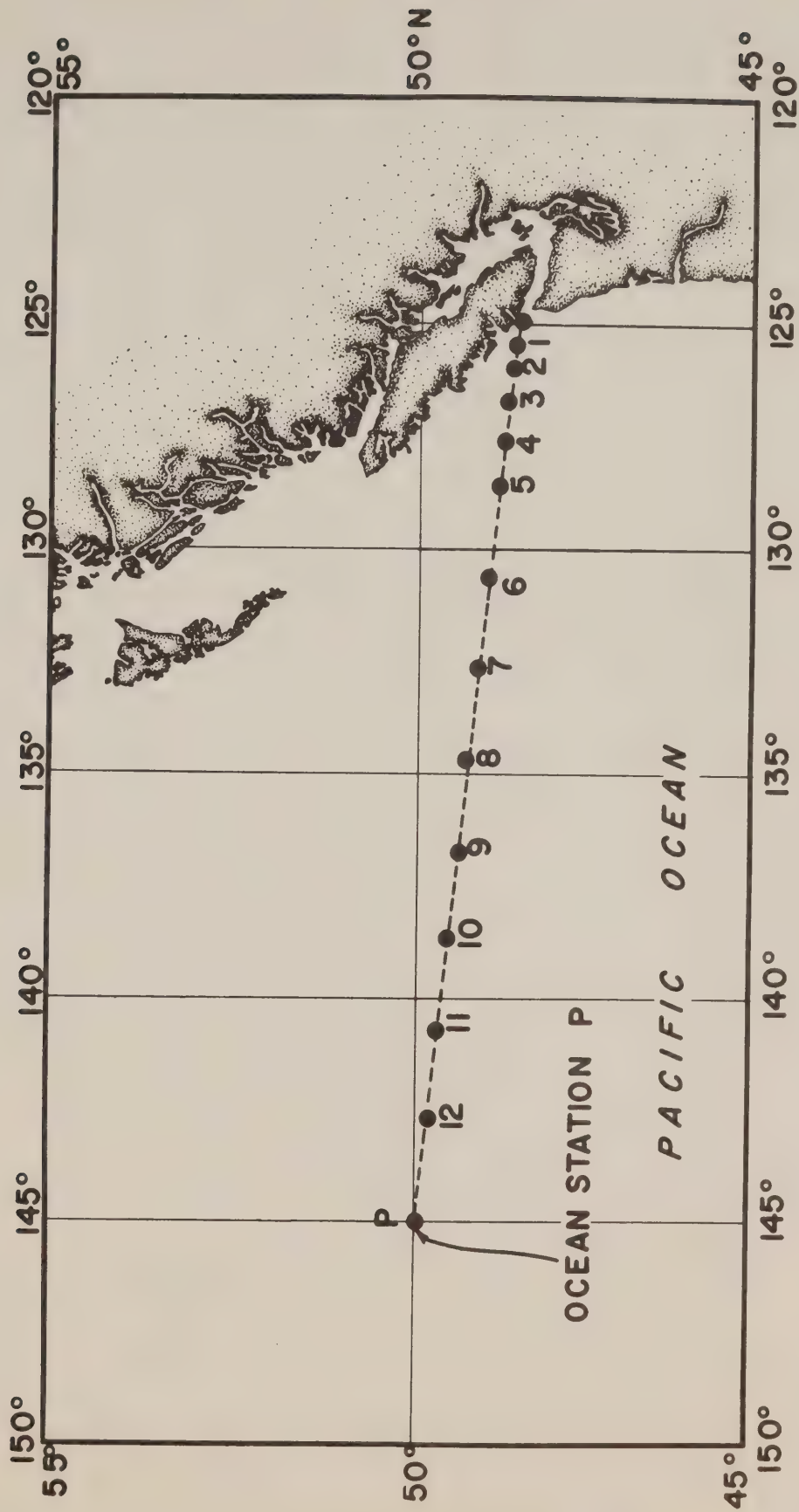


Fig. 1 Chart showing Line P station positions.

OCEANOGRAPHIC DATA OBTAINED ON CRUISE P-73-1
(CODC REFERENCE No. 15-73-001)

RESULTS OF BOTTLE CASTS

(P-73-1)

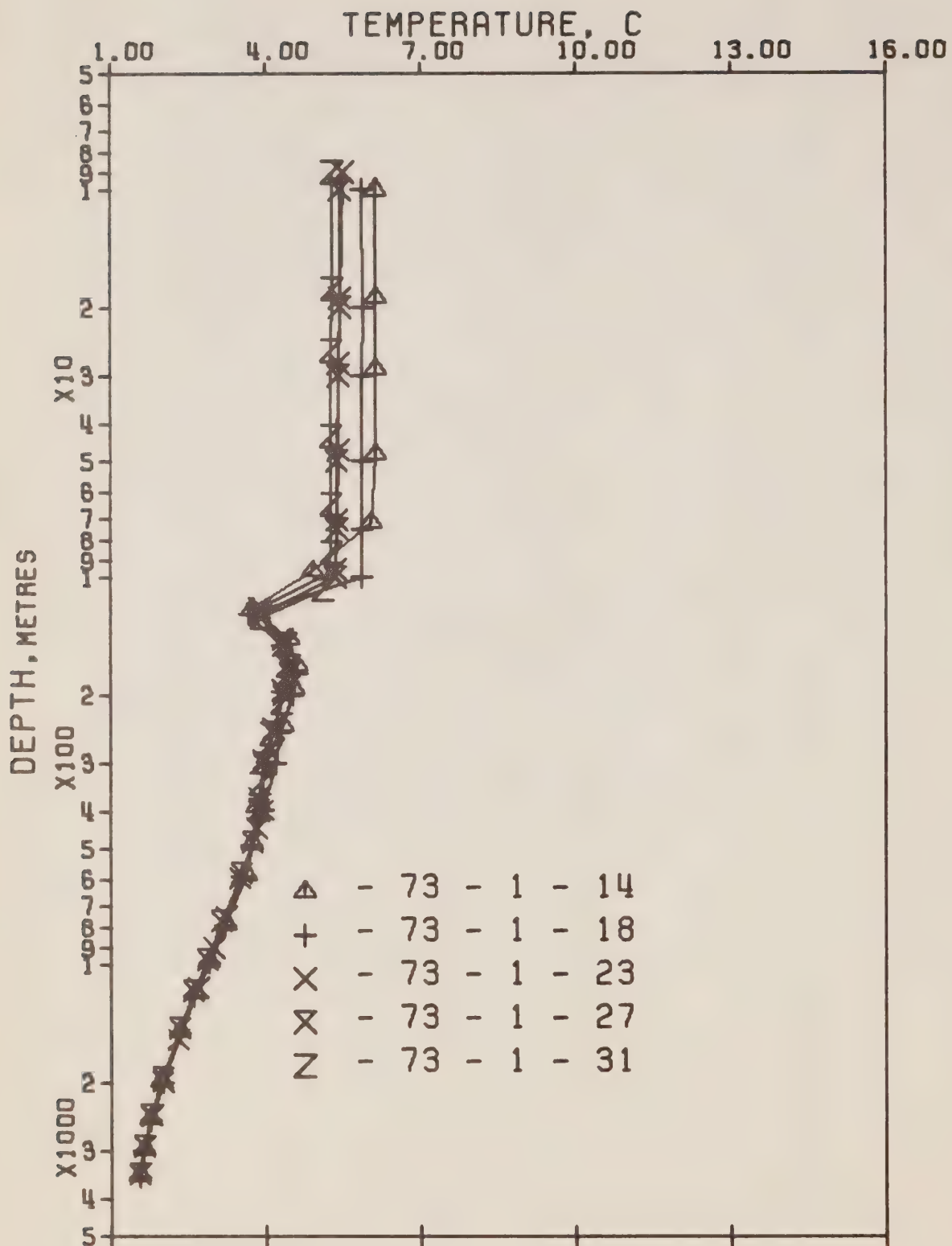


Figure 2 Composite plot of temperature vs \log_{10} depth. P-73-1

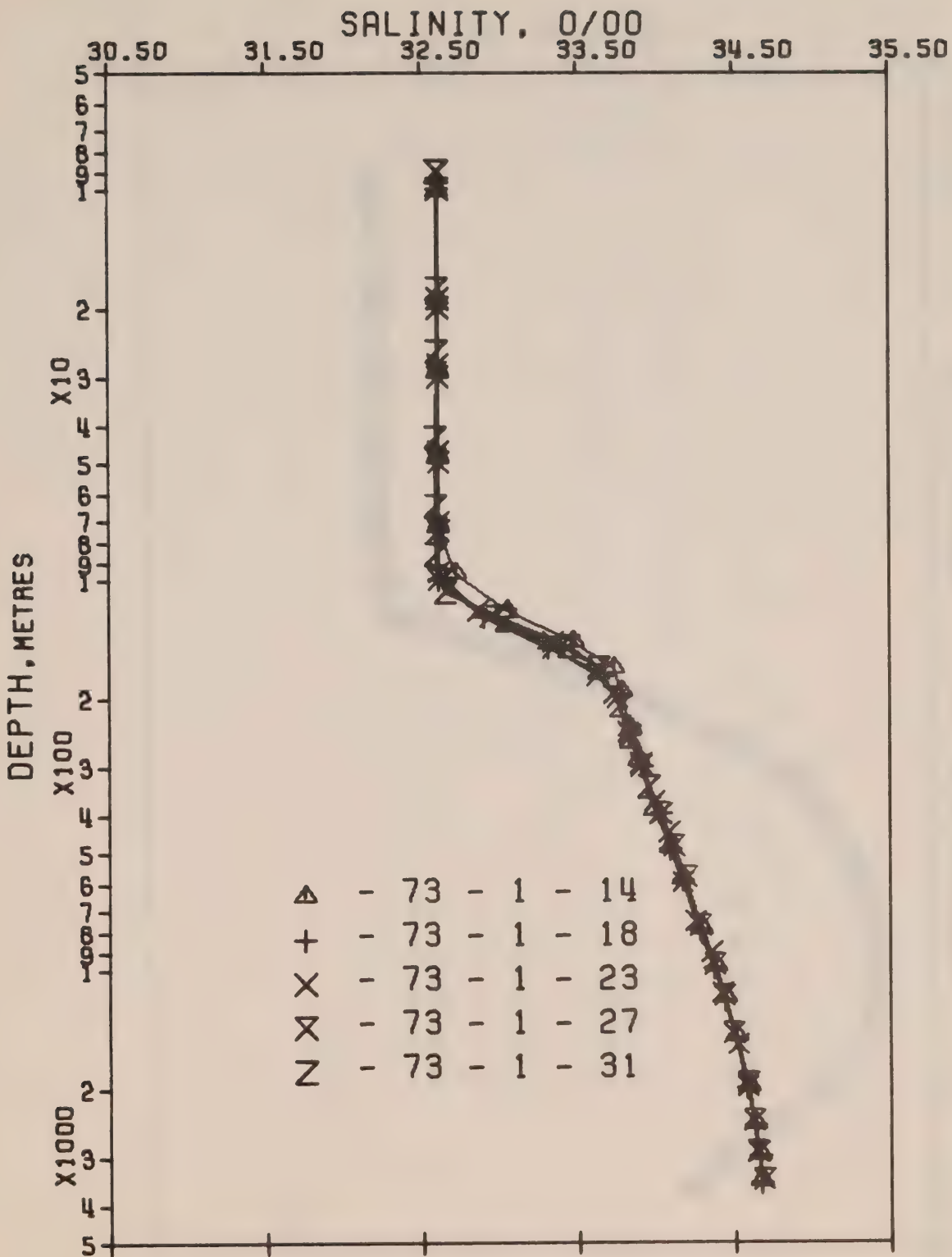


Figure 3 Composite plot of salinity vs \log_{10} depth. P-73-1

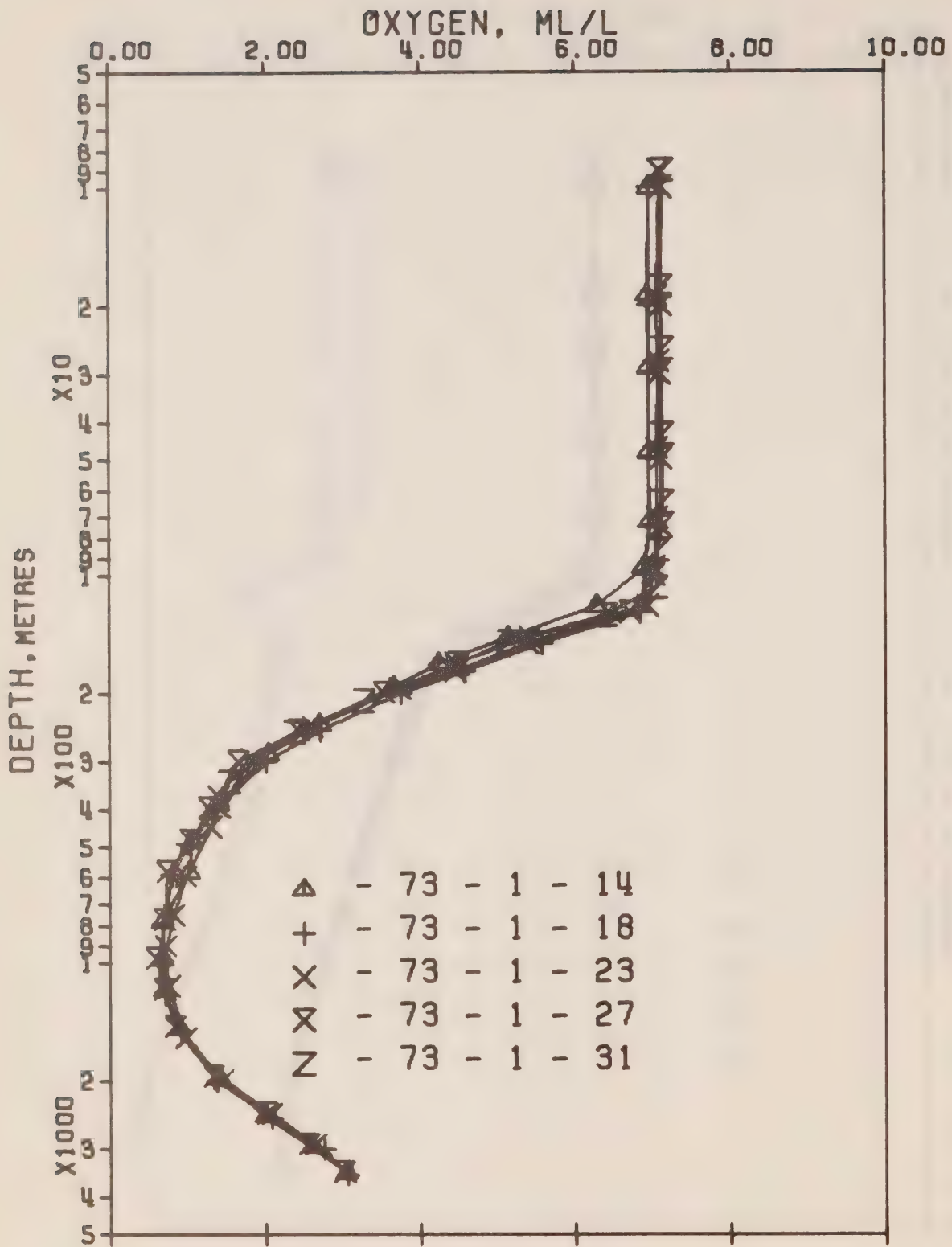
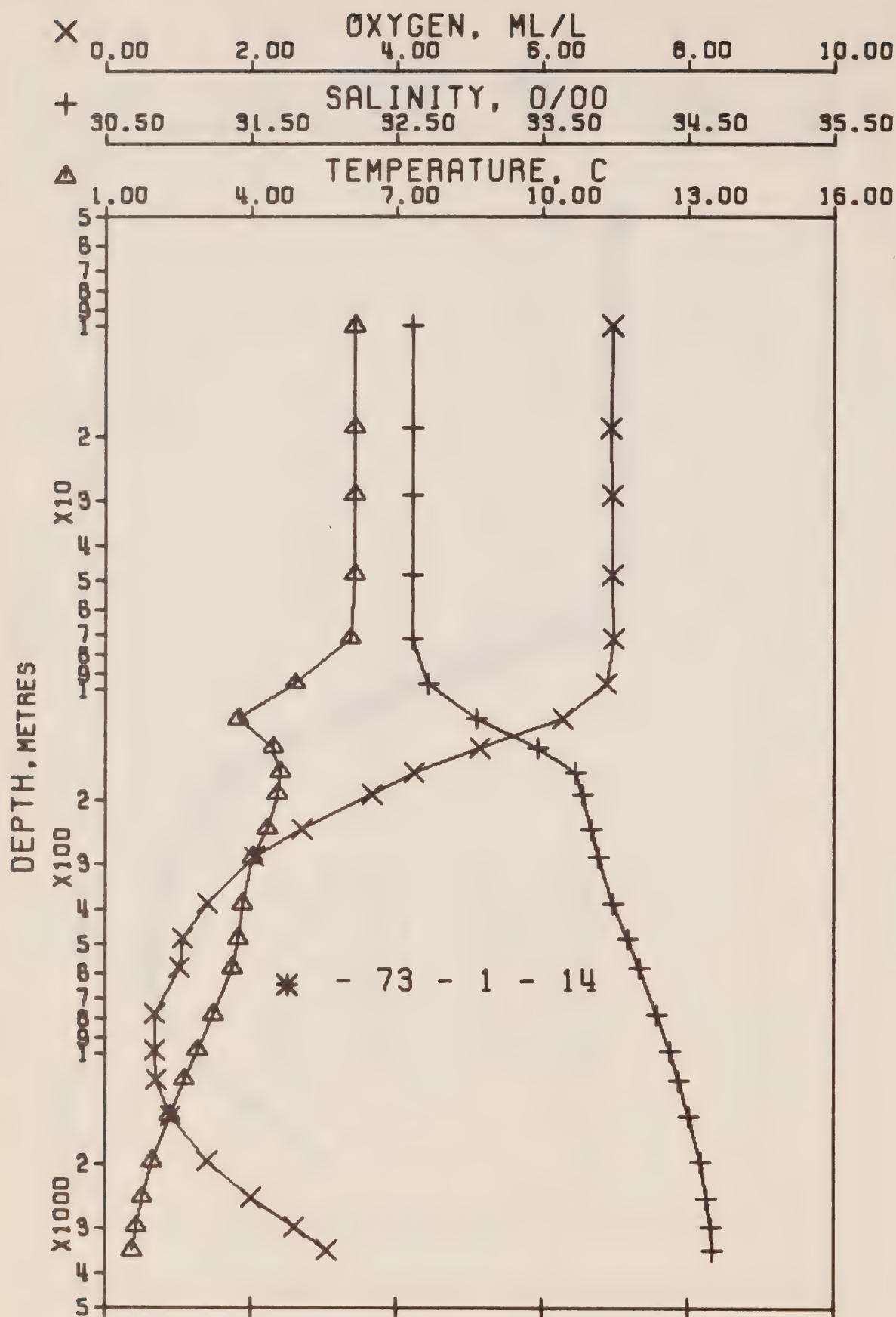
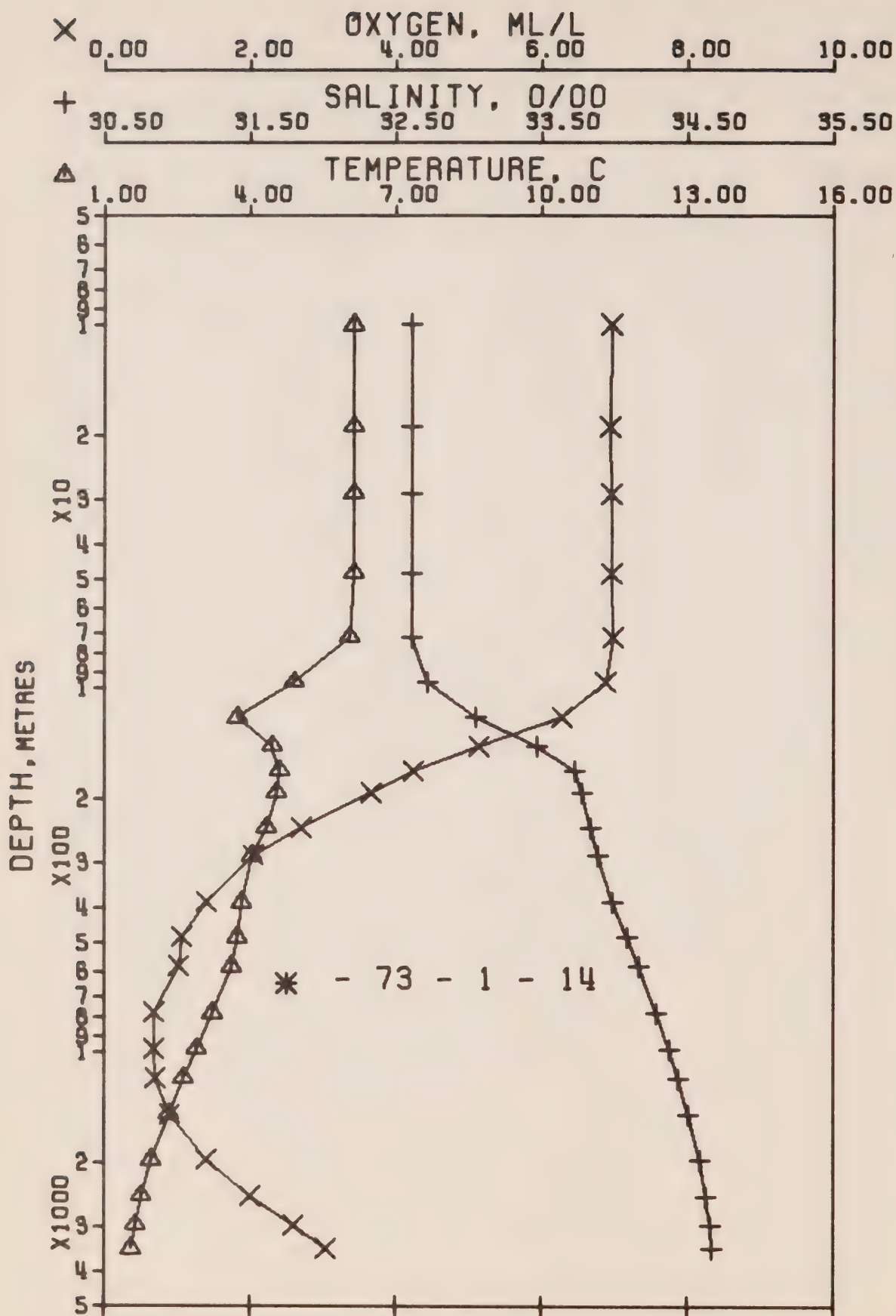


Figure 4 Composite plot of oxygen vs \log_{10} depth. P-73-1



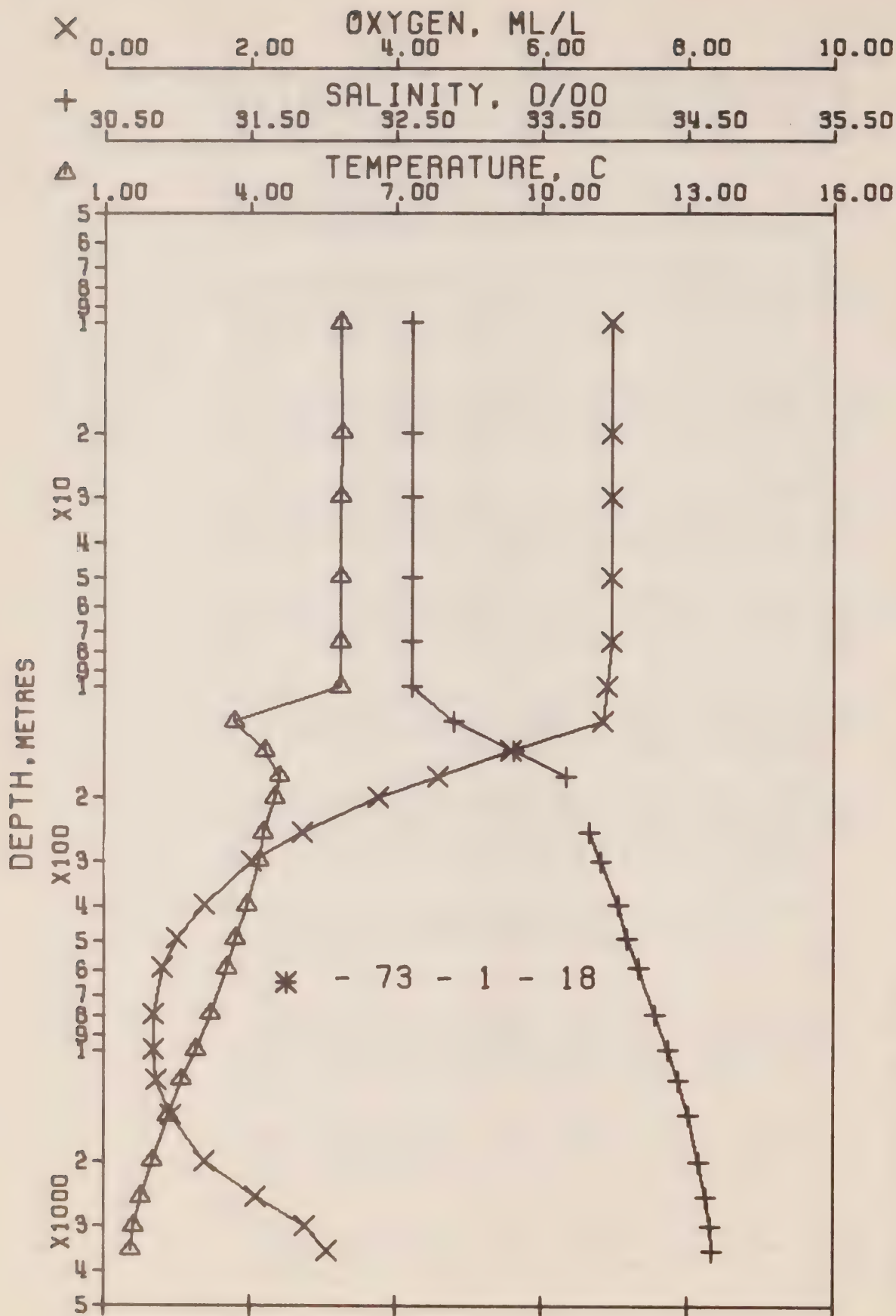


OFFSHORE OCEANOGRAPHY GROUP
 POSITION 49-55.0 N, 144-53.0 W GMT 20.2
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 1- 14

DATE 11/ 1/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	5.11	32.606	0	25.675	232.8	6.11	232.6	0.0	0.0	6.94	1472.
10	5.13	32.608	10	25.674	233.0	6.13	232.7	0.23	0.01	6.96	1473.
19	5.14	32.606	19	25.671	233.4	6.14	232.8	0.45	0.04	6.94	1473.
29	5.12	32.608	29	25.675	233.0	6.12	232.5	0.68	0.10	6.95	1473.
43	5.12	32.611	43	25.677	233.1	6.12	232.2	1.13	0.28	6.95	1473.
72	5.04	32.613	72	25.689	232.2	6.03	231.1	1.69	0.63	6.98	1473.
97	4.91	32.717	96	25.902	212.0	4.90	210.8	2.23	1.09	6.88	1469.
121	3.72	33.054	120	26.292	174.9	3.71	173.8	2.70	1.61	6.29	1465.
145	4.46	33.475	144	26.551	150.7	4.45	149.1	3.09	2.14	5.14	1469.
169	4.59	33.732	168	26.741	133.1	4.58	131.1	3.43	2.68	4.24	1470.
194	4.55	33.776	193	26.780	129.6	4.54	127.4	3.76	3.29	3.65	1471.
243	4.33	33.841	241	26.855	122.8	4.31	120.3	4.37	4.65	2.70	1471.
291	4.04	33.887	289	26.922	116.7	4.02	113.9	4.95	6.23	2.04	1470.
390	3.33	33.991	387	27.026	107.7	3.80	104.0	6.06	10.07	1.39	1471.
483	3.74	34.090	484	27.114	100.1	3.71	95.6	7.07	14.62	1.05	1473.
587	3.51	34.170	582	27.190	93.4	3.57	88.3	8.03	19.86	1.03	1474.
785	3.21	34.249	779	27.323	81.8	3.16	75.6	9.77	32.02	0.68	1475.
987	2.88	34.330	977	27.426	72.7	2.81	65.8	11.31	45.94	0.67	1477.
1188	2.62	34.440	1176	27.497	66.6	2.54	59.0	12.71	61.46	0.69	1480.
1492	2.31	34.509	1476	27.578	59.7	2.21	51.1	14.62	87.58	0.89	1484.
2000	1.97	34.588	1976	27.669	52.1	1.83	42.4	17.43	137.52	1.39	1491.
2511	1.76	34.632	2477	27.720	48.1	1.58	37.2	19.97	196.01	2.00	1498.
3017	1.62	34.656	2973	27.750	46.1	1.40	34.2	22.35	262.97	2.60	1506.
3519	1.54	34.674	3464	27.770	45.2	1.27	31.9	24.63	339.23	3.04	1515.

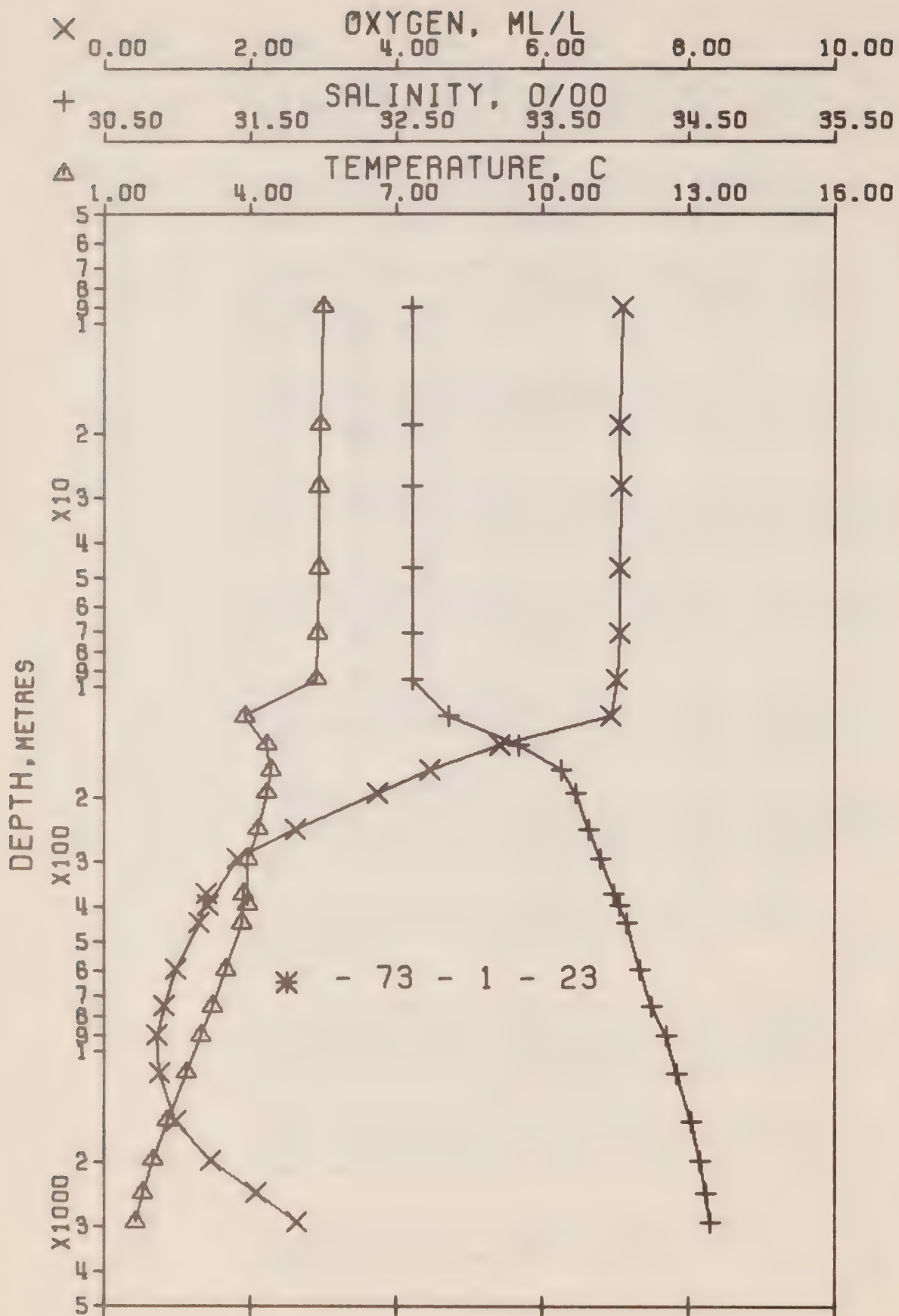


OFFSHORE OCEANOGRAPHY GROUP
 POSITION 49-47.0 N. 144-47.0 W GMT 0.0
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 1- 18

DATE 20/ 1/73

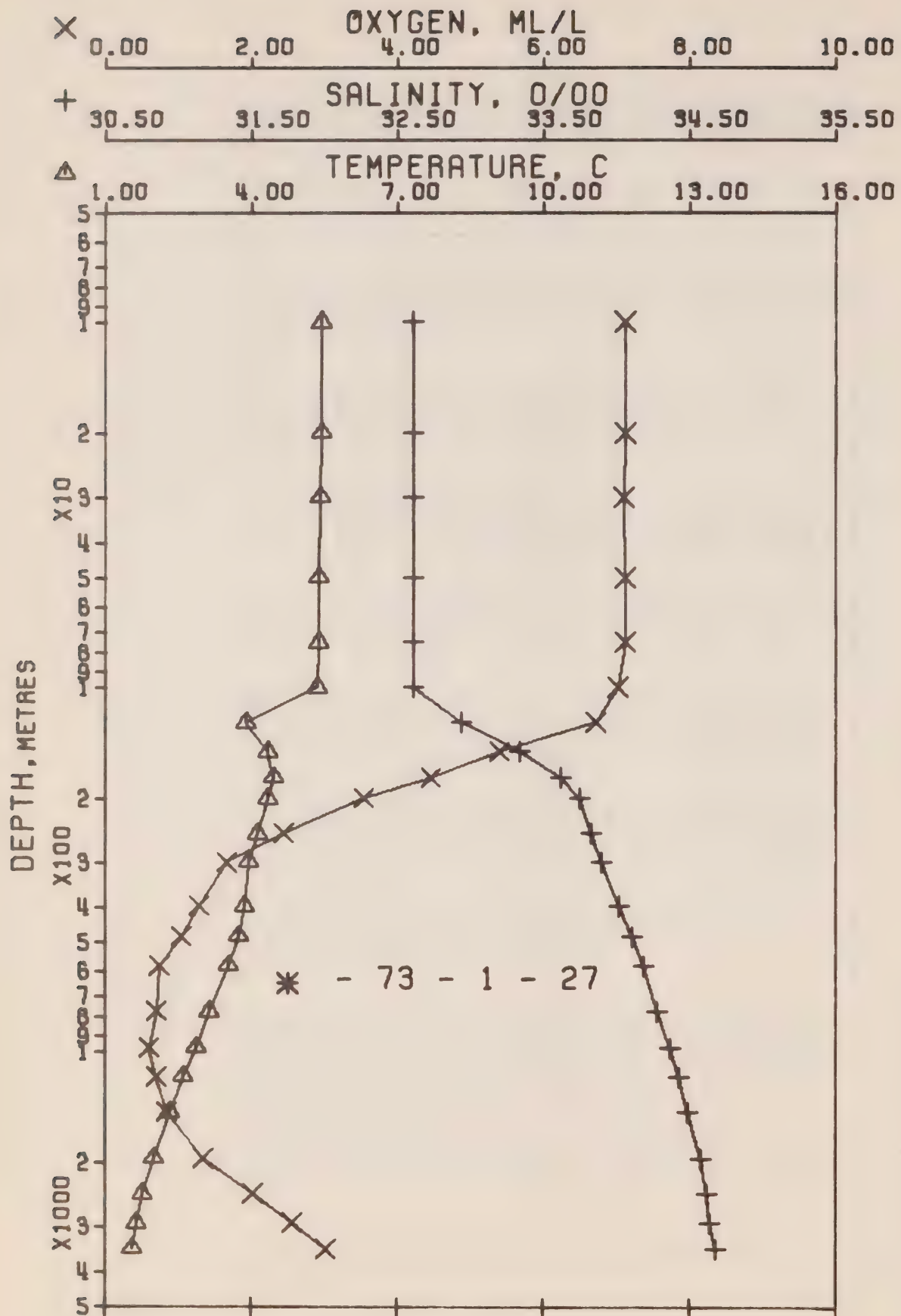
PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. FN	OXY	SOUND
0	5.86	32.611	0	25.709	229.5	5.86	229.3	0.0	0.0	6.97	1471.
10	5.87	32.609	10	25.706	229.9	5.87	229.5	0.23	0.01	6.96	1472.
20	5.88	32.611	20	25.707	229.9	5.88	229.5	0.46	0.05	6.96	1472.
30	5.87	32.610	30	25.707	230.0	5.87	229.4	0.69	0.11	6.96	1472.
50	5.87	32.609	50	25.706	230.3	5.87	229.5	1.16	0.30	6.97	1472.
75	5.86	32.608	75	25.707	230.5	5.85	229.4	1.74	0.67	6.97	1473.
101	5.86	32.608	100	25.707	230.8	5.85	229.4	2.32	1.20	6.91	1473.
126	3.67	32.839	125	26.174	186.1	3.66	185.0	2.85	1.80	6.85	1465.
151	4.30	33.306	150	26.434	161.8	4.29	160.3	3.29	2.42	5.59	1463.
177	4.60	33.669	176	26.690	138.0	4.59	135.9	3.68	3.07	4.58	1470.
202	4.52	33.800*	201	26.903	127.6	4.50	125.3	4.01	3.71	3.76	1471.
253	4.28	33.835	251	26.856	122.9	4.25	120.2	4.64	5.17	2.71	1471.
303	4.19	33.914	301	26.928	116.4	4.17	113.3	5.24	6.88	2.02	1471.
401	3.93	34.026	398	27.044	106.1	3.90	102.3	6.32	10.77	1.38	1472.
495	3.71	34.087	491	27.114	100.0	3.68	95.5	7.29	15.19	1.01	1472.
595	3.51	34.108	591	27.198	92.6	3.47	87.6	8.26	20.59	0.79	1473.
799	3.19	34.277	792	27.316	82.5	3.13	76.4	10.03	33.20	0.69	1476.
1003	2.88	34.372	993	27.420	73.5	2.81	66.4	11.62	47.72	0.68	1478.
1206	2.60	34.439	1194	27.498	66.6	2.52	58.9	13.04	63.72	0.73	1480.
1514	2.31	34.509	1497	27.578	59.8	2.21	51.1	14.97	90.47	0.92	1484.
2028	1.98	34.584	2003	27.665	52.6	1.84	42.7	17.83	142.16	1.38	1491.
2543	1.75	34.630	2509	27.719	48.2	1.57	37.3	20.41	202.35	2.08	1499.
3058	1.60	34.656	3013	27.751	45.9	1.37	34.0	22.82	271.15	2.75	1507.
3571	1.54	34.671	3515	27.768	45.5	1.26	32.1	25.16	350.29	3.07	1515.



OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50- 6.0 N. 145- 7.0 W GMT 23.9
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 1- 23 DATE 3/ 2/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	5.49	32.612	0	25.754	225.3	5.49	225.0	0.0	0.0	7.08	1470.
9	5.49	32.613	9	25.755	225.3	5.49	225.0	0.20	0.01	7.09	1470.
19	5.44	32.612	19	25.760	224.9	5.44	224.4	0.43	0.04	7.07	1470.
29	5.42	32.611	28	25.761	224.8	5.42	224.3	0.63	0.09	7.08	1470.
47	5.41	32.609	47	25.761	225.0	5.41	224.3	1.00	0.26	7.07	1470.
71	5.38	32.610	71	25.765	224.9	5.37	223.9	1.61	0.59	7.07	1471.
96	5.35	32.613	95	25.771	224.6	5.34	223.3	2.16	1.05	7.02	1471.
121	3.39	32.857	120	26.120	191.3	3.88	190.2	2.68	1.63	6.93	1465.
145	4.32	33.341	144	26.460	159.4	4.31	157.8	3.11	2.21	5.43	1468.
170	4.43	33.631	169	26.578	139.0	4.42	137.1	3.48	2.80	4.46	1470.
196	4.34	33.730	195	26.766	130.9	4.33	128.7	3.83	3.46	3.74	1470.
247	4.15	33.822	245	26.859	122.5	4.13	119.9	4.46	4.90	2.63	1470.
298	3.95	33.902	296	26.943	114.7	3.93	111.9	5.07	6.59	1.81	1470.
400	3.94	34.028	397	27.044	106.1	3.91	102.2	6.19	10.57	1.43	1472.
372	3.84	33.980	369	27.021	108.0	3.81	104.5	5.89	9.38	1.40	1471.
448	3.83	34.080	444	27.097	101.4	3.80	97.2	6.68	12.69	1.31	1472.
601	3.49	34.175	596	27.206	91.9	3.45	86.8	8.16	20.59	0.98	1473.
757	3.22	34.246	750	27.288	84.9	3.17	79.0	9.53	30.12	0.82	1475.
914	2.97	34.350	905	27.394	75.5	2.91	68.8	10.79	40.80	0.72	1477.
1154	2.08	34.425	1142	27.480	68.2	2.60	60.6	12.50	58.84	0.77	1479.
1567	2.28	34.518	1550	27.588	59.0	2.17	50.2	15.11	95.08	0.99	1485.
2006	1.99	34.581	1982	27.661	52.8	1.85	43.0	17.55	139.51	1.46	1491.
2476	1.78	34.624	2443	27.712	48.8	1.60	38.0	19.93	193.74	2.07	1493.
2981	1.62	34.654	2938	27.748	46.2	1.40	34.4	22.32	200.28	2.64	1506.

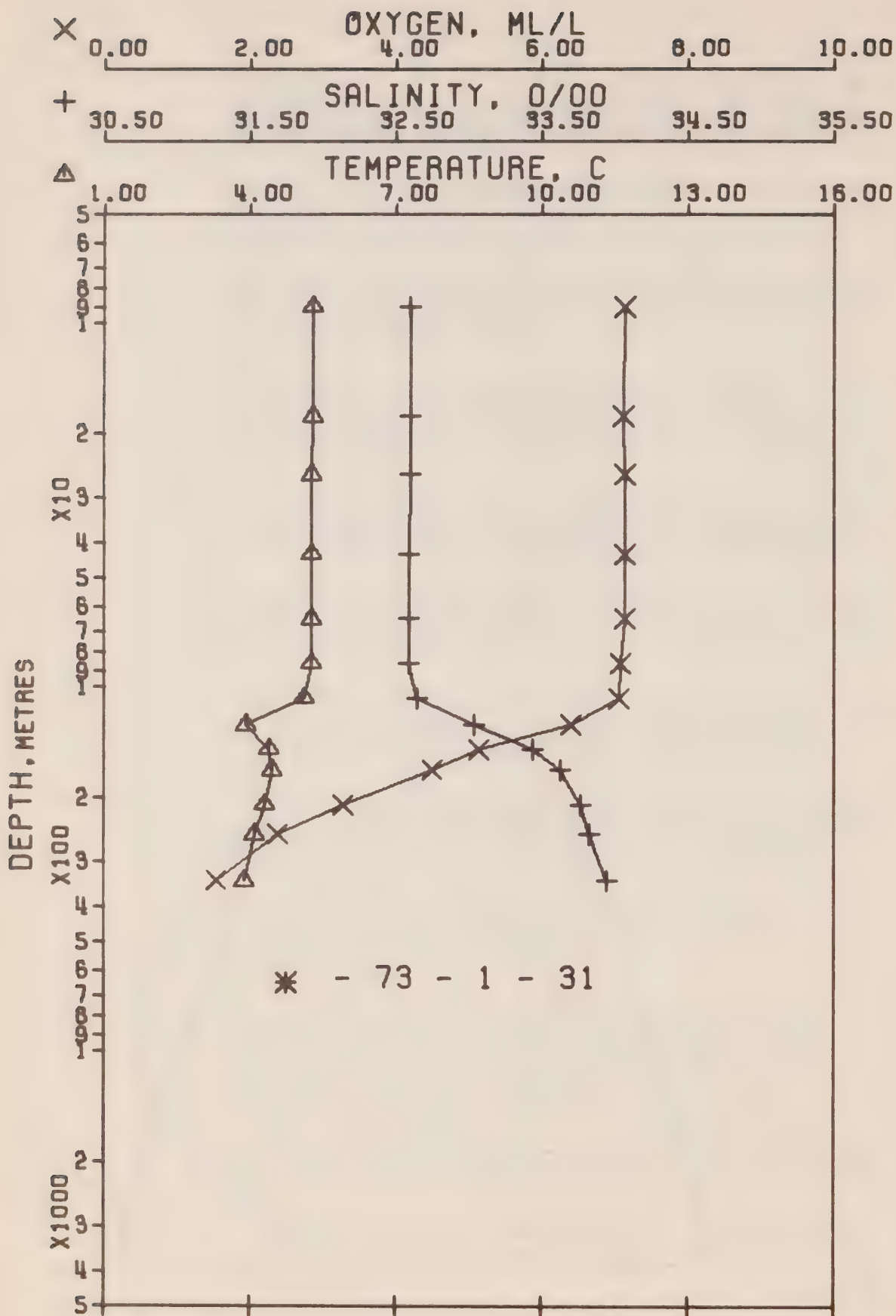


OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50- 0.0 N. 145- 4.0 W GMT 0.0
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 1- 27

DATE 10/ 2/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	5.44	32.604	0	25.753	225.3	5.44	225.0	0.0	0.0	7.12	1470.
10	5.45	32.610	10	25.757	225.0	5.45	224.7	0.23	0.01	7.12	1470.
20	5.43	32.610	20	25.759	224.9	5.43	224.5	0.45	0.05	7.12	1470.
30	5.40	32.610	30	25.763	224.6	5.40	224.1	0.68	0.10	7.11	1470.
50	5.39	32.610	50	25.764	224.8	5.39	224.0	1.13	0.29	7.11	1470.
75	5.38	32.609	75	25.764	225.0	5.37	224.0	1.70	0.65	7.12	1471.
101	5.34	32.610	100	25.770	224.7	5.33	223.4	2.27	1.17	7.03	1471.
126	3.89	32.941	125	26.186	185.0	3.88	183.8	2.79	1.77	6.72	1466.
151	4.32	33.343	150	26.462	159.3	4.31	157.7	3.22	2.37	5.40	1463.
177	4.44	33.622	176	26.670	139.8	4.43	137.8	3.61	3.02	4.46	1470.
202	4.32	33.746	201	26.781	129.5	4.31	127.3	3.95	3.68	3.54	1470.
253	4.11	33.832	251	26.871	121.3	4.09	118.8	4.57	5.13	2.44	1470.
303	3.93	33.902	301	26.945	114.6	3.91	111.7	5.17	6.82	1.67	1470.
401	3.35	34.021	393	27.048	105.7	3.82	101.9	6.24	10.68	1.29	1471.
485	3.73	34.109	481	27.130	98.5	3.70	94.1	7.10	14.54	1.04	1472.
583	3.53	34.190	578	27.214	91.1	3.49	86.0	8.02	19.58	0.75	1473.
781	3.14	34.277	774	27.320	81.9	3.09	75.9	9.73	31.45	0.70	1475.
578	2.85	34.369	969	27.420	73.2	2.78	66.4	11.25	45.12	0.60	1477.
1177	2.50	34.429	1165	27.490	67.2	2.52	59.6	12.64	60.38	0.71	1479.
1475	2.33	34.491	1459	27.562	61.1	2.23	52.7	14.55	86.15	0.83	1483.
1975	1.99	34.579	1951	27.660	52.9	1.85	43.2	17.38	135.83	1.34	1490.
2479	1.76	34.620	2440	27.710	48.9	1.58	38.1	19.92	193.58	2.03	1498.
2987	1.62	34.638	2944	27.735	47.3	1.40	35.5	22.36	261.60	2.55	1506.
3501	1.54	34.676	3446	27.772	44.9	1.27	31.8	24.73	339.90	3.02	1514.



OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50- 0.0 N. 144-56.0 W GMT 18.9
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 1- 31

DATE 18/ 2/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	5.26	32.596	0	25.768	223.9	5.26	223.7	0.0	0.0	7.12	1469.
9	5.29	32.596	9	25.764	224.3	5.29	224.0	0.20	0.01	7.13	1469.
13	5.29	32.596	18	25.764	224.4	5.29	224.0	0.41	0.04	7.12	1469.
26	5.27	32.596	20	25.767	224.2	5.27	223.8	0.59	0.08	7.14	1469.
43	5.27	32.595	43	25.766	224.5	5.27	223.9	0.97	0.21	7.13	1470.
65	5.27	32.595	65	25.766	224.7	5.26	223.9	1.47	0.49	7.13	1470.
87	5.27	32.595	86	25.766	224.9	5.26	223.8	1.94	0.86	7.08	1470.
108	5.12	32.653	107	25.829	219.1	5.11	217.8	2.42	1.33	7.06	1470.
128	3.91	33.036	127	26.260	178.1	3.90	170.8	2.82	1.81	6.40	1466.
149	4.39	33.443	148	26.534	152.5	4.38	150.9	3.17	2.30	5.14	1469.
170	4.44	33.631	169	26.677	139.1	4.43	137.2	3.47	2.80	4.50	1470.
212	4.30	33.769	210	26.802	127.6	4.28	125.4	4.02	3.86	3.29	1470.
255	4.10	33.830	253	26.871	121.3	4.08	118.8	4.56	5.14	2.38	1470.
344	3.89	33.951	341	26.988	110.8	3.87	107.6	5.58	8.27	1.55	1471.

RESULTS OF STD CASTS

(P-73-1)

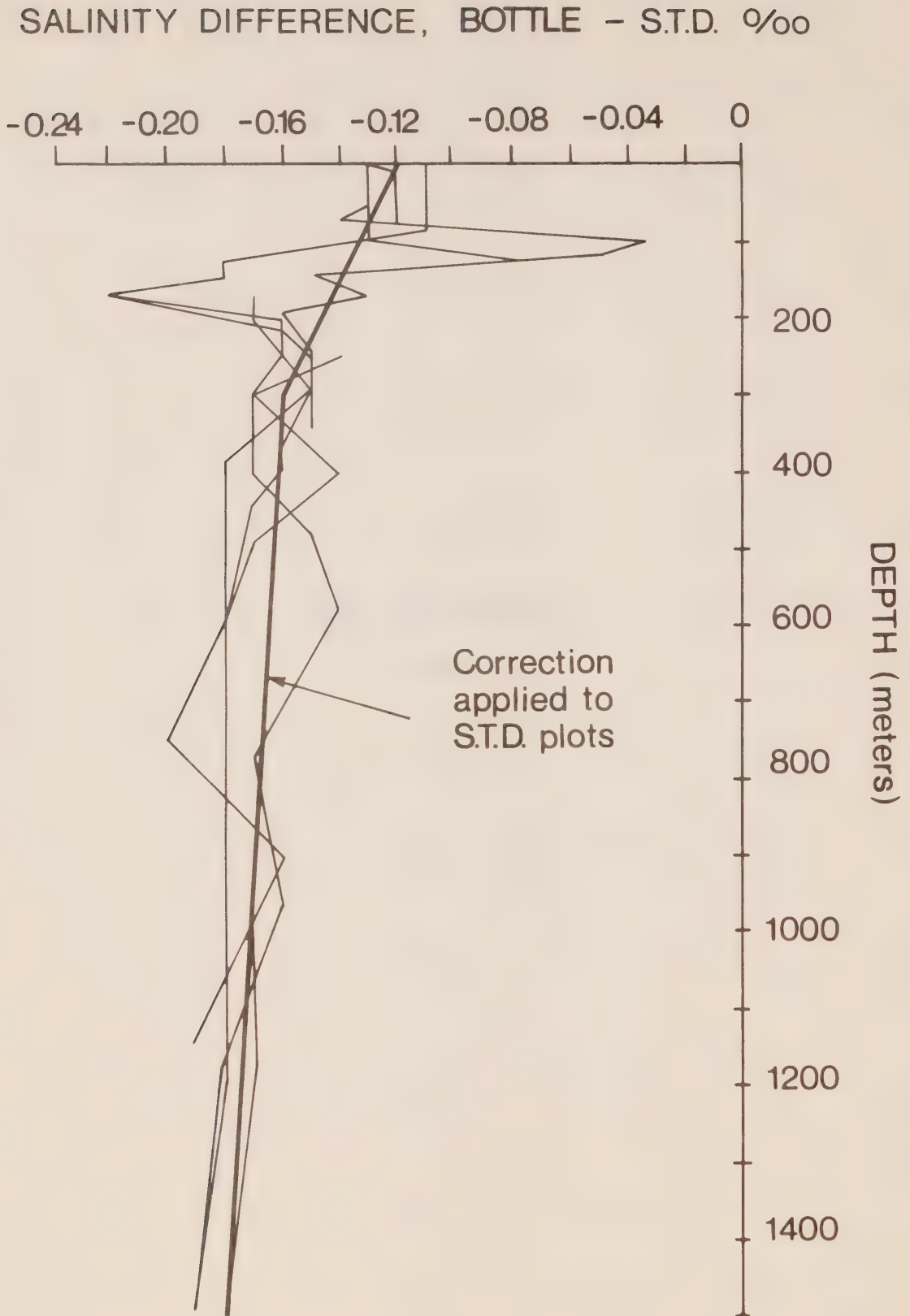


Figure 5

Salinity difference between hydro data and STD. P-73-1

TEMPERATURE DIFFERENCE
REVERSING THERMOMETERS-ST.D. ($^{\circ}\text{C}$)

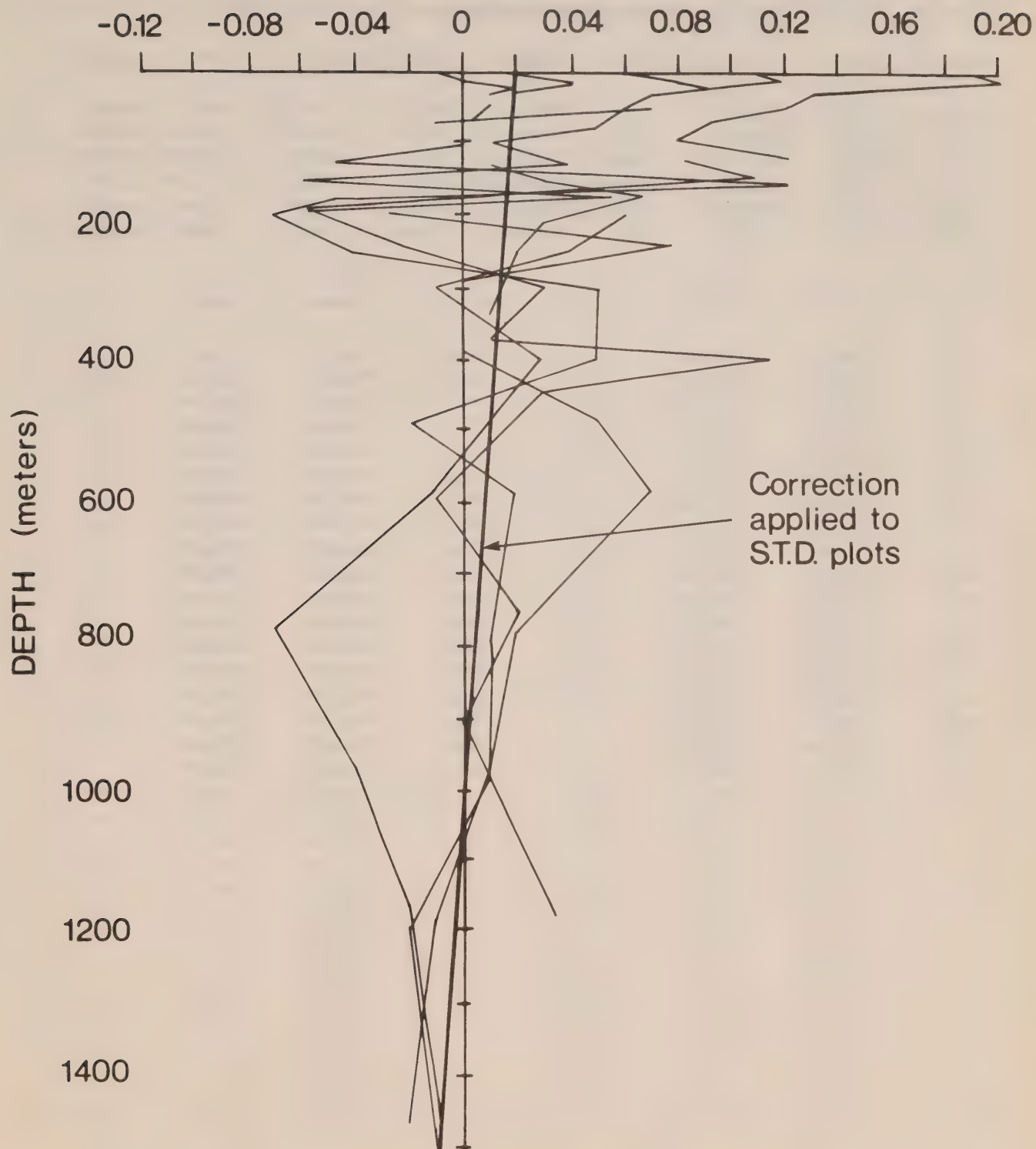


Figure 6

Temperature difference between hydro data and STD. P-73-1

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 1- 1

DATE 6/ 1/73

POSITION 48-33.0N, 125-33.0W GMT 0.0

RESULTS OF STP CAST 36 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.97	32.53	0	25.22	276.3	0.0	0.0	1483.
10	8.97	32.53	10	25.22	276.7	0.28	0.01	1484.
20	8.98	32.53	20	25.21	276.9	0.55	0.06	1484.
30	8.98	32.53	30	25.21	277.1	0.83	0.13	1484.
50	8.98	32.53	50	25.21	277.4	1.38	0.35	1484.
75	9.04	32.57	75	25.24	275.8	2.08	0.79	1485.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	8.97	32.53	69.	9.01	32.55
2.	8.97	32.53	70.	9.01	32.55
5.	8.98	32.53	71.	9.01	32.56
9.	8.97	32.53	72.	9.03	32.56
11.	8.97	32.53	74.	9.03	32.56
11.	8.97	32.53	75.	9.04	32.57
15.	8.97	32.53	78.	9.03	32.58
17.	8.98	32.53	79.	9.05	32.59
18.	8.98	32.53	79.	9.06	32.59
24.	8.98	32.53	81.	9.07	32.59
34.	8.98	32.53	83.	9.09	32.60
37.	8.98	32.53	83.	9.11	32.61
48.	8.98	32.53	84.	9.13	32.62
54.	8.98	32.53	86.	9.14	32.62
64.	8.98	32.53	90.	9.15	32.62
64.	8.99	32.55	92.	9.15	32.63
65.	8.99	32.55	94.	9.15	32.64
67.	9.00	32.55	97.	9.16	32.64

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 1- 2

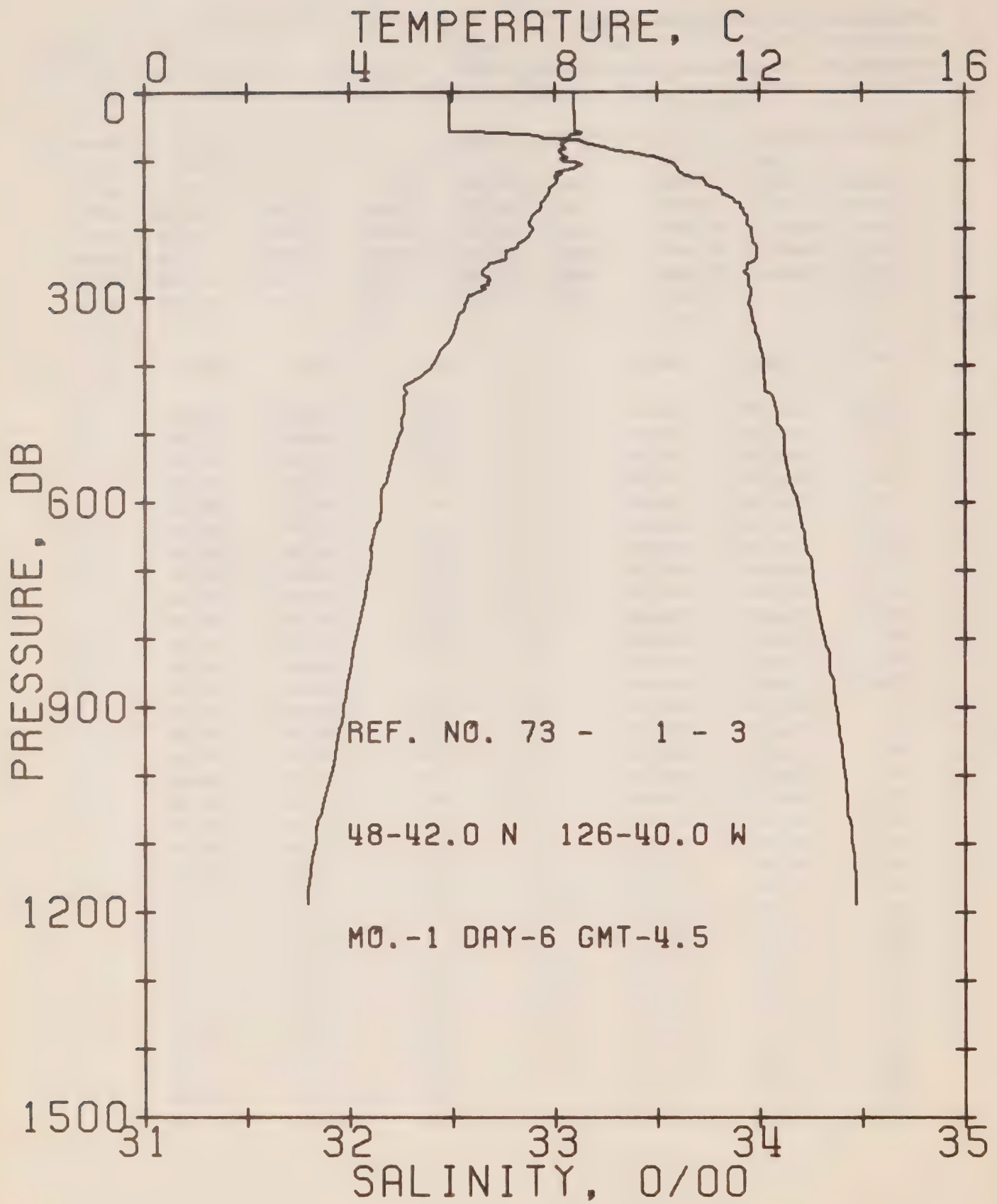
DATE 6/ 1/73

POSITION 48-38.0N, 126- 0.0W GMT 2.0

RESULTS OF STP CAST 64 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.29	32.00	0	24.90	305.9	0.0	0.0	1480.
10	8.30	32.01	10	24.91	305.7	0.31	0.02	1480.
20	8.67	32.17	20	24.98	298.8	0.61	0.06	1482.
30	8.95	32.29	30	25.03	294.5	0.91	0.14	1484.
50	8.99	32.40	50	25.11	287.3	1.49	0.38	1484.
75	9.02	32.62	75	25.28	271.8	2.20	0.82	1485.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	8.29	32.00	37.	8.98	32.34
1.	8.29	32.00	39.	8.99	32.35
3.	8.28	32.00	41.	8.99	32.35
3.	8.28	32.00	45.	8.99	32.35
5.	8.28	32.00	47.	8.99	32.39
6.	8.28	32.00	48.	8.99	32.39
8.	8.28	32.00	49.	8.99	32.39
9.	8.28	32.00	51.	9.00	32.41
12.	8.35	32.03	52.	9.00	32.41
12.	8.37	32.04	53.	9.00	32.43
14.	8.43	32.06	59.	9.00	32.43
16.	8.43	32.08	61.	9.00	32.44
17.	8.47	32.09	63.	9.00	32.45
18.	8.51	32.12	67.	9.00	32.46
19.	8.63	32.15	67.	9.00	32.48
19.	8.61	32.17	69.	9.01	32.50
21.	8.73	32.18	69.	9.01	32.52
23.	8.79	32.19	70.	9.01	32.52
23.	8.81	32.20	72.	9.02	32.54
24.	8.86	32.21	73.	9.02	32.59
25.	8.86	32.22	75.	9.02	32.62
26.	8.86	32.22	75.	9.03	32.63
27.	8.90	32.22	76.	9.04	32.67
27.	8.90	32.23	77.	9.05	32.70
28.	8.90	32.24	79.	9.06	32.73
29.	8.92	32.24	81.	9.07	32.74
30.	8.95	32.29	82.	9.08	32.76
31.	8.97	32.29	83.	9.10	32.81
32.	8.98	32.31	83.	9.11	32.81
34.	8.98	32.31	84.	9.10	32.82
35.	8.98	32.33	87.	9.10	32.84
36.	8.98	32.33	88.	9.08	32.85



OFFSHORE OCEANOGRAPHY GROUP

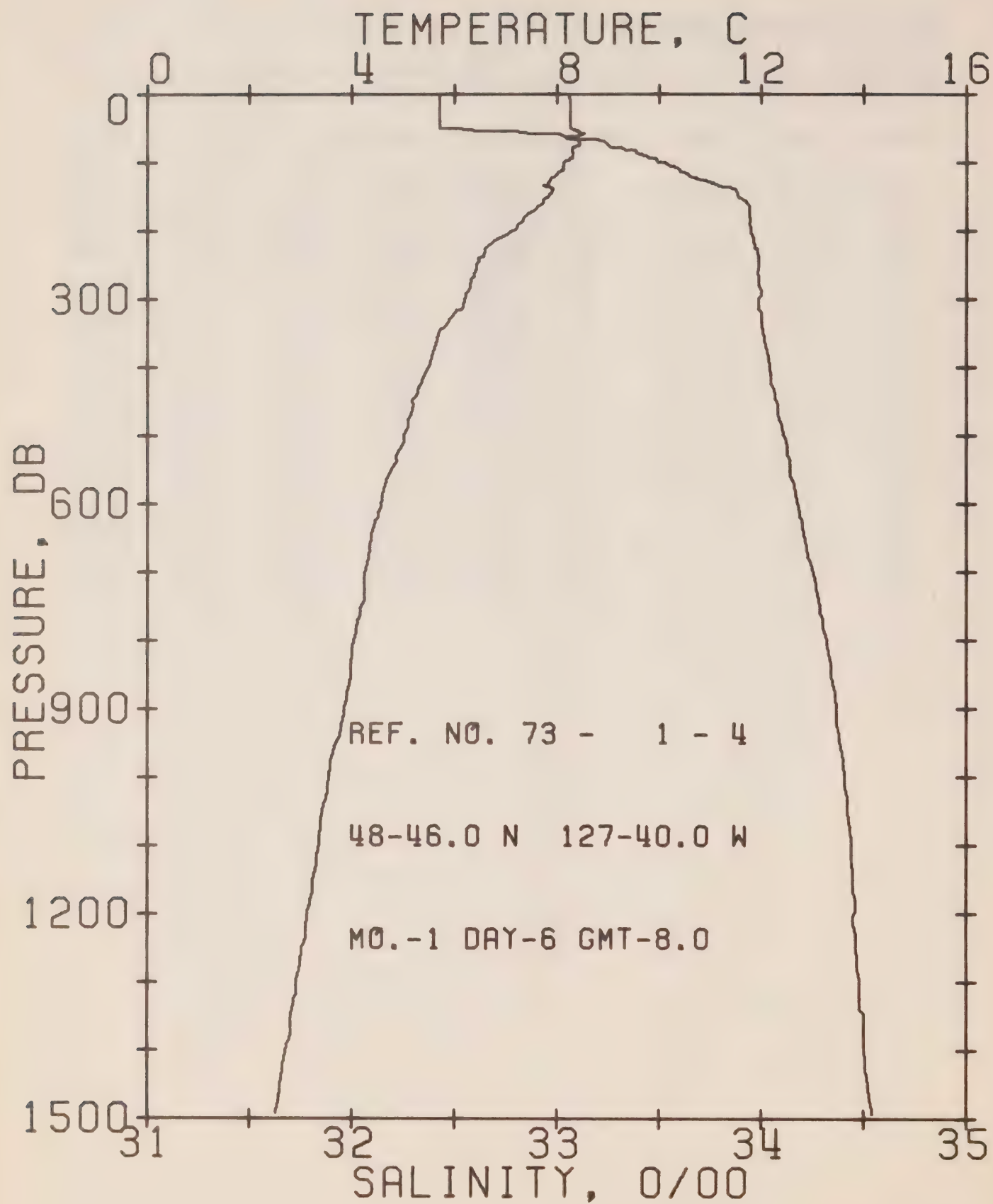
REFERENCE NO. 73- 1- 3

DATE 6/ 1/73

POSITION 48-42.0N, 126-40.0W GMT 4.5

RESULTS OF STP CAST 215 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.38	32.48	0	25.27	271.4	0.0	0.0	1481.
10	8.38	32.49	10	25.27	271.3	0.27	0.01	1481.
20	8.38	32.49	20	25.27	271.3	0.54	0.06	1481.
30	8.39	32.49	30	25.27	271.4	0.81	0.12	1482.
50	8.39	32.49	50	25.27	271.8	1.36	0.35	1482.
75	8.15	33.16	75	25.83	219.0	1.98	0.74	1482.
100	8.15	33.55	99	26.14	190.4	2.49	1.20	1483.
125	8.00	33.67	124	26.26	179.5	2.96	1.73	1483.
150	7.88	33.82	149	26.39	167.4	3.40	2.34	1483.
175	7.67	33.82	174	26.50	157.4	3.80	3.00	1483.
200	7.56	33.96	199	26.55	153.3	4.18	3.74	1483.
225	7.28	33.99	223	26.61	147.5	4.55	4.56	1482.
250	6.77	33.96	248	26.66	143.2	4.93	5.44	1481.
300	6.30	33.96	298	26.72	138.0	5.64	7.44	1480.
400	5.61	34.02	397	26.85	125.9	6.96	12.16	1479.
500	4.98	34.12	496	27.00	112.1	8.14	17.55	1478.
600	4.52	34.18	595	27.10	103.8	9.23	23.62	1478.
800	4.11	34.32	793	27.26	90.0	11.16	37.41	1480.
1000	3.61	34.42	991	27.39	78.3	12.84	52.76	1481.



OFFSHORE OCEANOGRAPHY GROUP

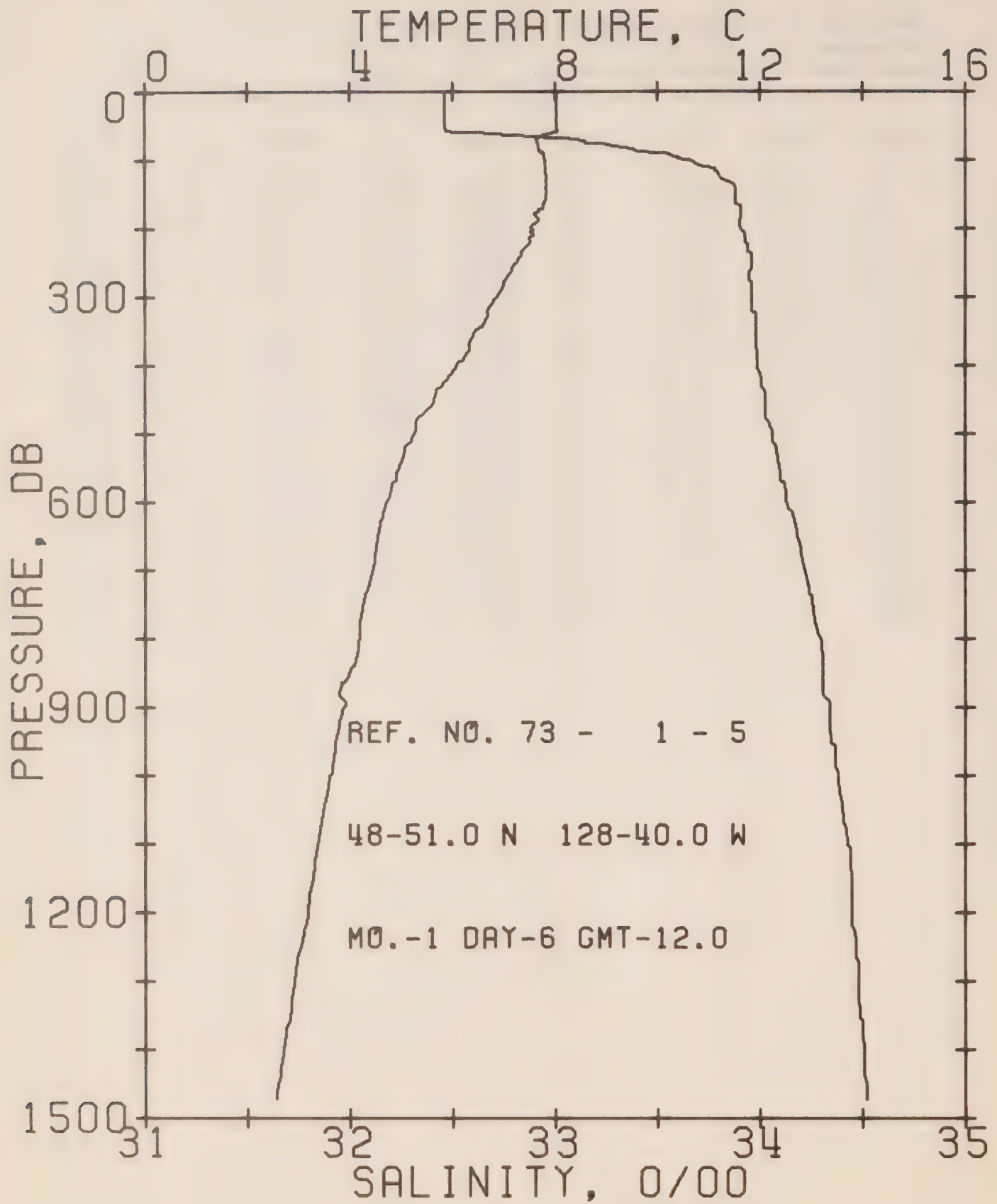
REFERENCE NO. 73- 1- 4

DATE 6/ 1/73

POSITION 48-46.0N, 127-40.0W GMT 8.0

RESULTS OF STP CAST 227 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.25	32.43	0	25.25	273.3	0.0	0.0	1481.
10	8.27	32.43	10	25.24	273.9	0.27	0.01	1481.
20	8.26	32.43	20	25.24	274.1	0.55	0.06	1481.
30	8.26	32.43	30	25.24	274.1	0.82	0.13	1481.
50	8.26	32.43	50	25.24	274.5	1.37	0.35	1481.
75	8.44	33.25	75	25.86	216.7	1.96	0.72	1484.
100	8.14	33.50	99	26.10	194.0	2.47	1.17	1483.
125	7.88	33.72	124	26.31	174.4	2.93	1.70	1483.
150	7.83	33.89	149	26.45	161.8	3.35	2.29	1483.
175	7.43	33.94	174	26.55	152.6	3.74	2.93	1482.
200	7.15	33.95	199	26.60	148.3	4.11	3.65	1482.
225	6.60	33.97	223	26.69	139.9	4.47	4.43	1480.
250	6.44	33.99	248	26.72	136.6	4.82	5.27	1480.
300	6.19	33.99	298	26.76	134.1	5.49	7.16	1479.
400	5.48	34.04	397	26.88	122.9	6.77	11.72	1478.
500	5.02	34.11	496	26.99	113.2	7.95	17.12	1478.
600	4.57	34.18	595	27.10	103.3	9.04	23.18	1478.
800	4.02	34.32	793	27.27	88.6	10.96	36.84	1479.
1000	3.53	34.41	991	27.39	77.9	12.63	52.18	1480.
1200	3.12	34.46	1188	27.47	71.1	14.12	68.95	1482.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 1- 5

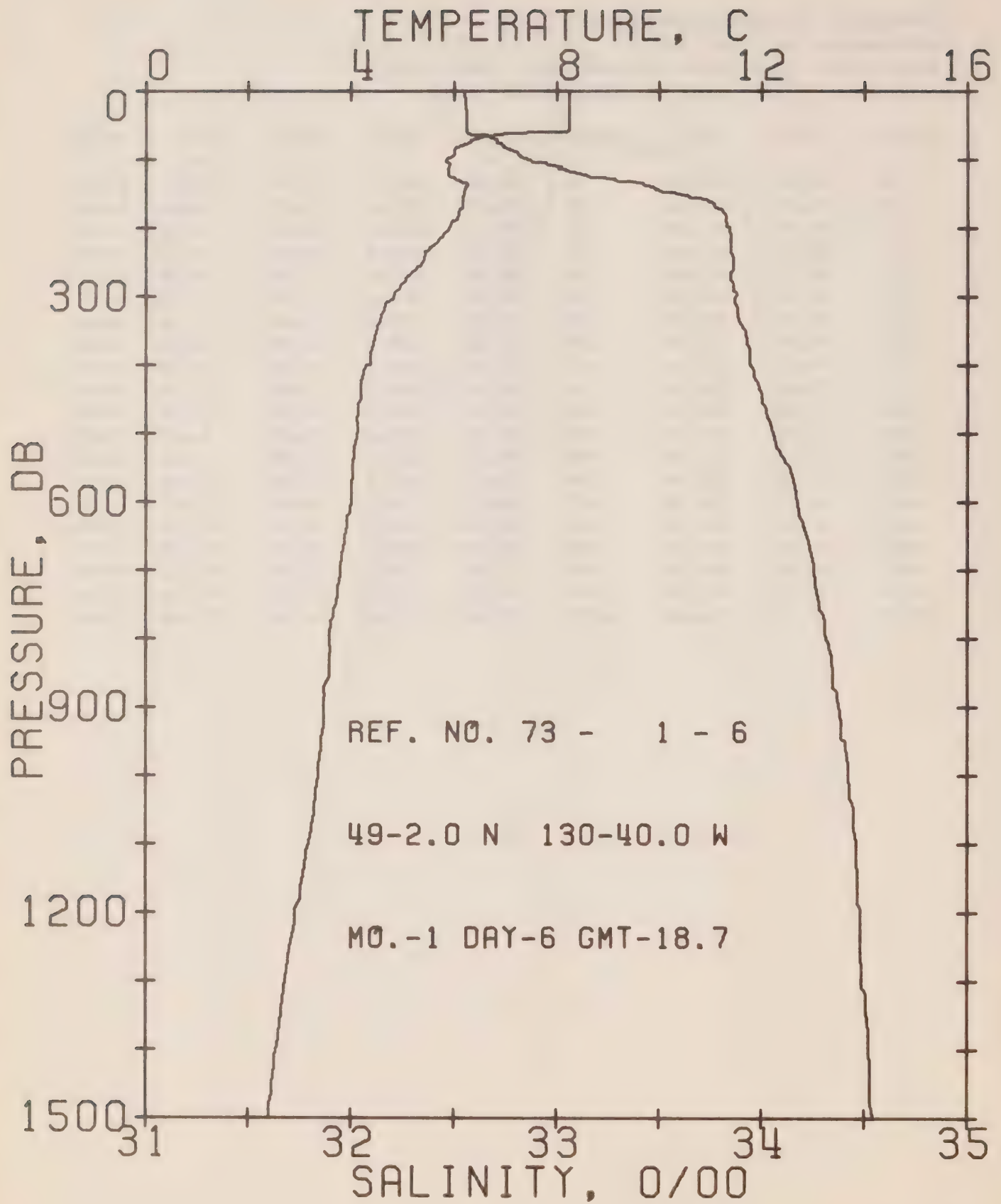
DATE 6/ 1/73

POSITION 48-51.0N, 128-40.0W

GMT 12.0

RESULTS OF STP CAST 222 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.02	32.46	0	25.30	267.8	0.0	0.0	1480.
10	8.02	32.46	10	25.30	268.3	0.27	0.01	1480.
20	8.02	32.46	20	25.30	268.4	0.54	0.05	1480.
30	8.03	32.46	30	25.30	268.6	0.80	0.12	1480.
50	8.03	32.46	50	25.30	269.0	1.34	0.34	1481.
75	7.65	33.15	75	25.90	212.8	1.96	0.73	1480.
100	7.80	33.64	99	26.26	178.8	2.44	1.16	1482.
125	7.84	33.81	124	26.38	167.4	2.87	1.65	1483.
150	7.82	33.88	149	26.44	162.2	3.28	2.22	1483.
175	7.68	33.91	174	26.49	158.3	3.68	2.89	1483.
200	7.53	33.90	199	26.51	156.9	4.08	3.64	1483.
225	7.45	33.94	223	26.54	153.6	4.46	4.48	1483.
250	7.24	33.96	248	26.59	149.6	4.84	5.40	1483.
300	6.85	33.96	298	26.64	145.1	5.58	7.47	1482.
400	6.08	33.99	397	26.77	134.0	6.97	12.43	1481.
500	5.24	34.06	495	26.93	119.5	8.24	18.22	1479.
600	4.71	34.13	595	27.04	108.9	9.38	24.60	1478.
800	4.18	34.29	793	27.23	92.4	11.38	38.81	1480.
1000	3.60	34.38	991	27.36	80.9	13.11	54.66	1481.
1200	3.18	34.45	1188	27.45	72.3	14.62	71.62	1482.



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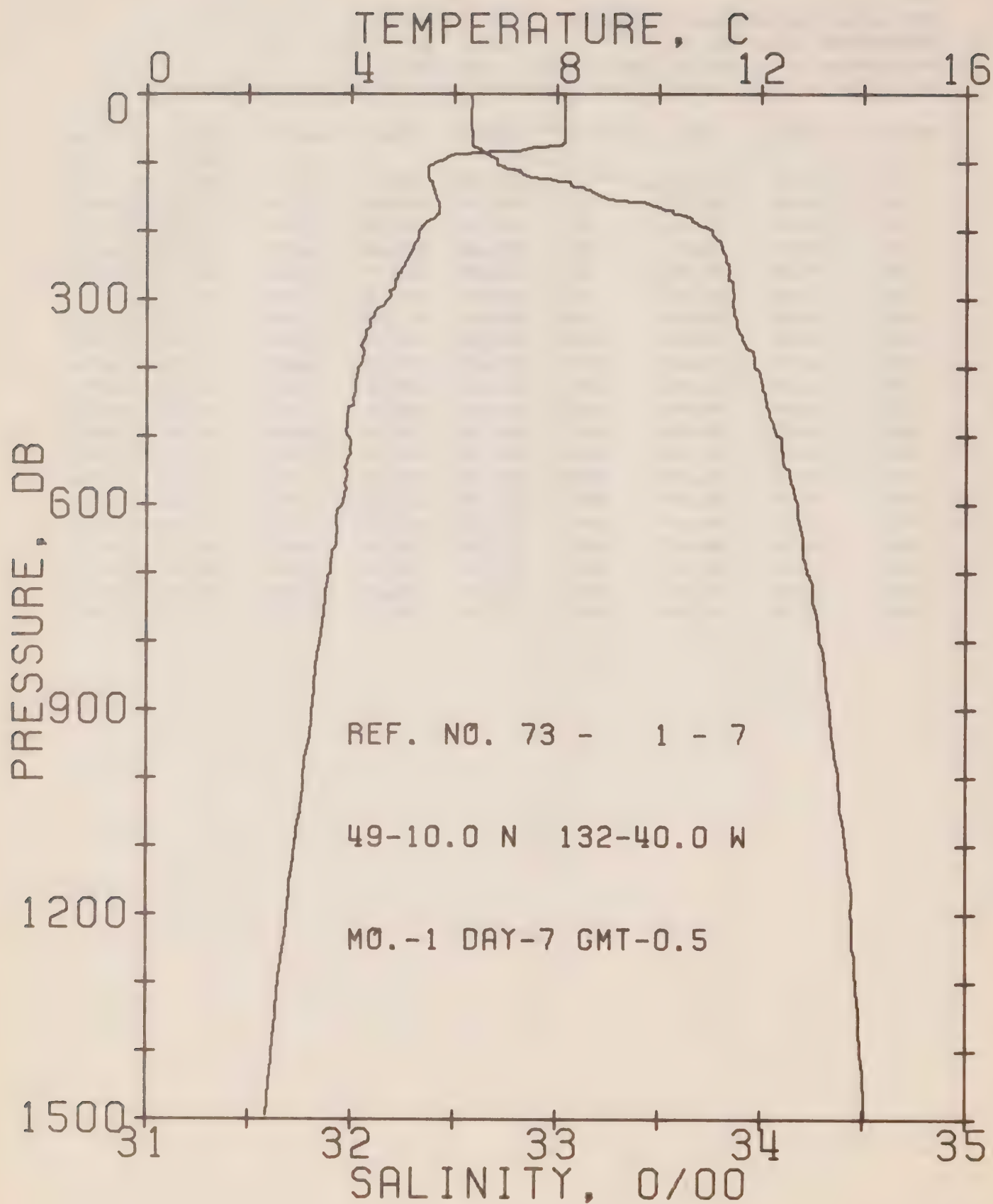
REFERENCE NO. 73- 1- 6

DATE 6/ 1/73

POSITION 49- 2.0N, 130-40.0W GMT 18.7

RESULTS OF STP CAST 249 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.25	32.55	0	25.34	264.4	0.0	0.0	1481.
10	8.25	32.55	10	25.34	264.5	0.26	0.01	1481.
20	8.25	32.56	20	25.34	264.5	0.53	0.05	1481.
30	8.25	32.56	30	25.35	264.4	0.79	0.12	1481.
50	8.25	32.56	50	25.35	264.7	1.32	0.34	1482.
75	6.29	32.71	75	25.73	228.0	1.94	0.73	1474.
100	5.85	32.86	99	25.91	211.8	2.49	1.22	1473.
125	5.94	33.17	124	26.14	190.0	3.00	1.79	1474.
150	6.18	33.60	149	26.45	161.1	3.43	2.41	1476.
175	6.08	33.81	174	26.63	144.6	3.81	3.03	1477.
200	5.90	33.84	199	26.67	140.4	4.17	3.72	1476.
225	5.62	33.85	223	26.72	136.7	4.52	4.47	1476.
250	5.39	33.86	248	26.75	133.4	4.85	5.28	1475.
300	4.83	33.87	298	26.83	126.4	5.50	7.10	1474.
400	4.36	33.94	397	26.93	117.2	6.71	11.40	1473.
500	4.11	34.06	496	27.05	106.6	7.82	16.49	1474.
600	3.98	34.17	595	27.16	97.4	8.83	22.16	1475.
800	3.57	34.31	793	27.31	83.8	10.64	35.01	1477.
1000	3.35	34.42	990	27.41	75.0	12.22	49.51	1480.
1200	2.91	34.48	1188	27.50	66.9	13.64	65.41	1481.



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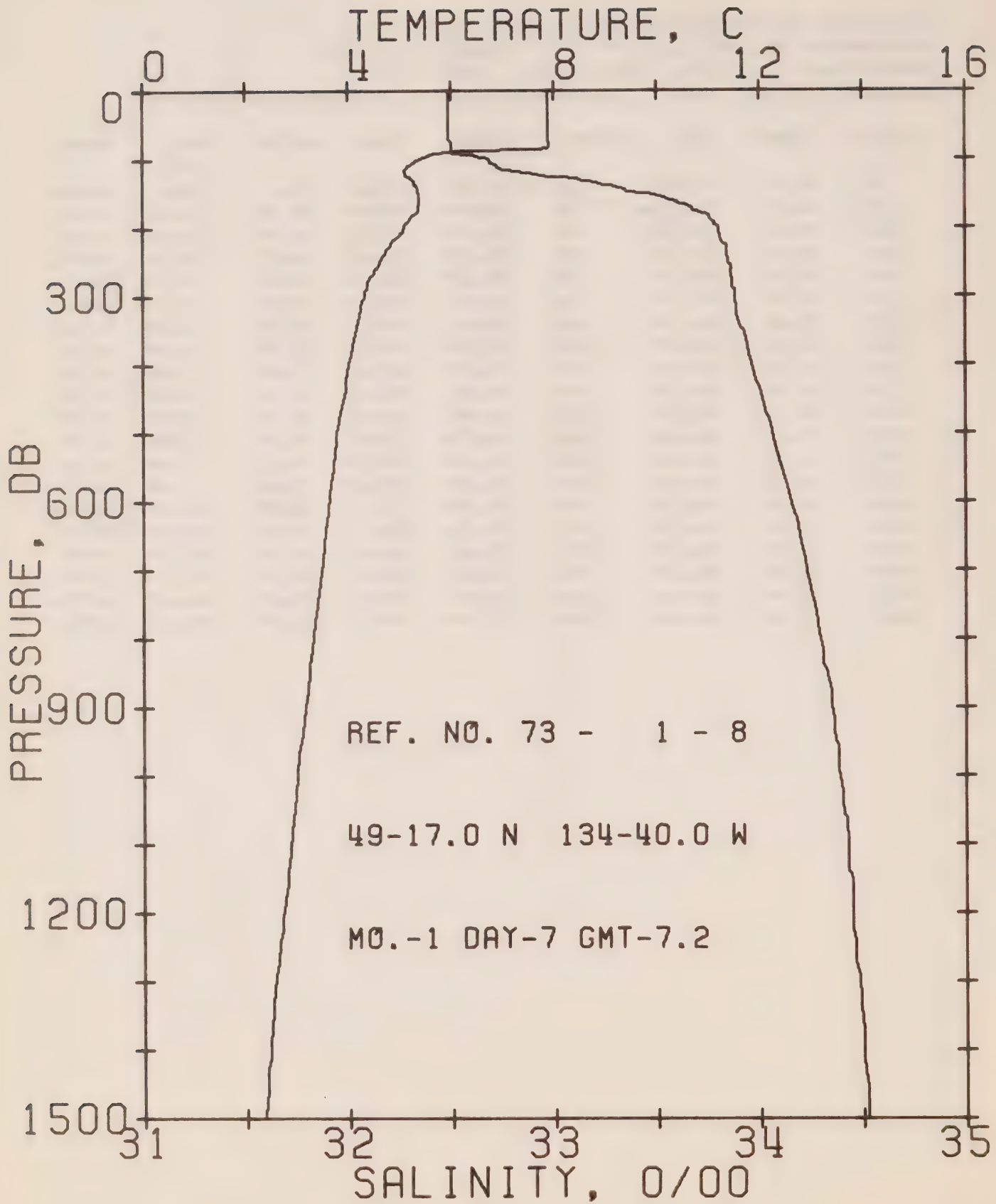
REFERENCE NO. 73- 1- 7

DATE 7/ 1/73

POSITION 49-10.0N, 132-40.0W GMT 0.5

RESULTS OF STP CAST 222 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.14	32.58	0	25.38	260.6	0.0	0.0	1480.
10	8.15	32.59	10	25.39	260.4	0.26	0.01	1481.
20	8.15	32.59	20	25.38	260.8	0.52	0.05	1481.
30	8.15	32.58	30	25.38	261.3	0.79	0.12	1481.
50	8.15	32.58	50	25.38	261.5	1.31	0.33	1481.
75	8.08	32.59	75	25.40	260.4	1.96	0.75	1481.
100	5.64	32.71	99	25.81	220.6	2.55	1.27	1472.
125	5.52	32.97	124	26.03	200.3	3.08	1.88	1472.
150	5.55	33.22	149	26.21	183.1	3.56	2.55	1474.
175	5.71	33.58	174	26.49	157.2	3.98	3.24	1475.
200	5.32	33.76	199	26.68	139.7	4.35	3.95	1474.
225	5.20	33.81	223	26.73	134.6	4.69	4.69	1474.
250	5.03	33.84	248	26.78	130.8	5.02	5.49	1474.
300	4.73	33.87	298	26.83	125.8	5.66	7.29	1473.
400	4.15	33.97	397	26.98	112.7	6.85	11.53	1473.
500	3.94	34.08	496	27.08	103.2	7.93	16.44	1474.
600	3.83	34.18	595	27.18	95.2	8.92	22.01	1475.
800	3.40	34.29	793	27.30	83.9	10.71	34.73	1476.
1000	3.06	34.38	990	27.41	74.8	12.29	49.23	1478.
1200	2.75	34.44	1188	27.49	68.0	13.72	65.15	1480.



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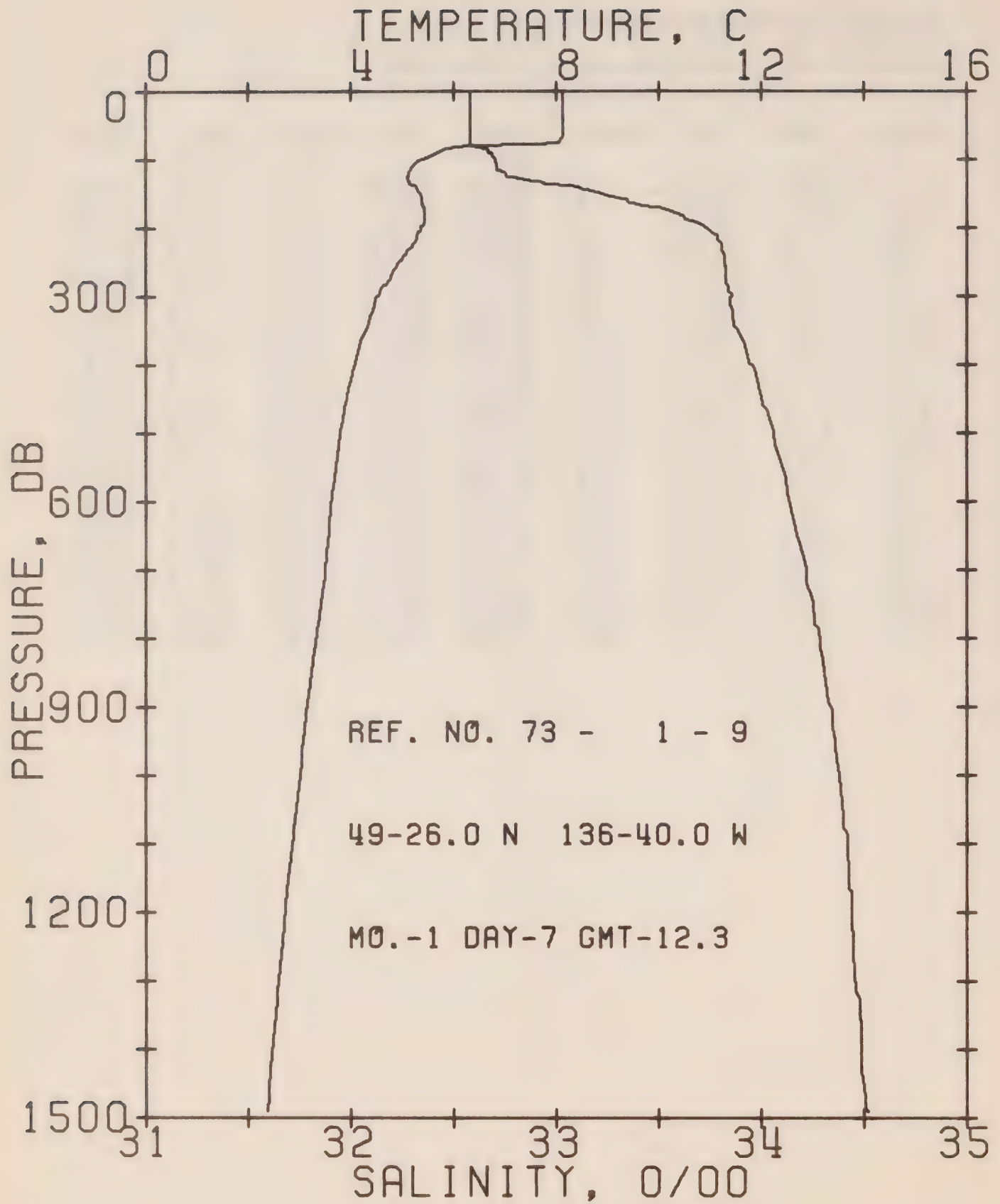
REFERENCE NO. 73- 1- 8

DATE 7/ 1/73

POSITION 49-17.0N, 134-40.0W GMT 7.2

RESULTS OF STP CAST 196 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.88	32.49	0	25.35	263.8	0.0	0.0	1479.
10	7.89	32.49	10	25.35	264.2	0.26	0.01	1479.
20	7.90	32.49	20	25.34	264.5	0.53	0.05	1480.
30	7.90	32.49	30	25.34	264.7	0.79	0.12	1480.
50	7.90	32.49	50	25.34	265.0	1.32	0.34	1480.
75	7.92	32.50	75	25.35	264.8	1.99	0.76	1481.
100	5.43	32.67	99	25.81	220.9	2.61	1.31	1471.
125	5.15	32.96	124	26.07	196.6	3.14	1.92	1471.
150	5.38	33.41	149	26.40	165.7	3.58	2.54	1473.
175	5.36	33.68	174	26.61	145.6	3.96	3.17	1474.
200	5.09	33.80	199	26.74	133.9	4.31	3.83	1473.
225	4.82	33.83	223	26.80	128.5	4.64	4.55	1472.
250	4.61	33.85	248	26.83	125.3	4.96	5.31	1472.
300	4.32	33.88	298	26.89	120.3	5.57	7.03	1472.
400	4.01	33.96	397	26.98	111.8	6.73	11.16	1472.
500	3.77	34.06	496	27.09	102.6	7.80	16.07	1473.
600	3.62	34.15	595	27.17	95.1	8.79	21.61	1474.
800	3.30	34.30	793	27.32	82.4	10.56	34.18	1476.
1000	2.99	34.39	990	27.42	73.3	12.11	48.36	1478.
1200	2.72	34.45	1188	27.50	67.0	13.50	64.01	1480.
1500	2.34	34.52	1484	27.58	59.2	15.38	89.80	1484.



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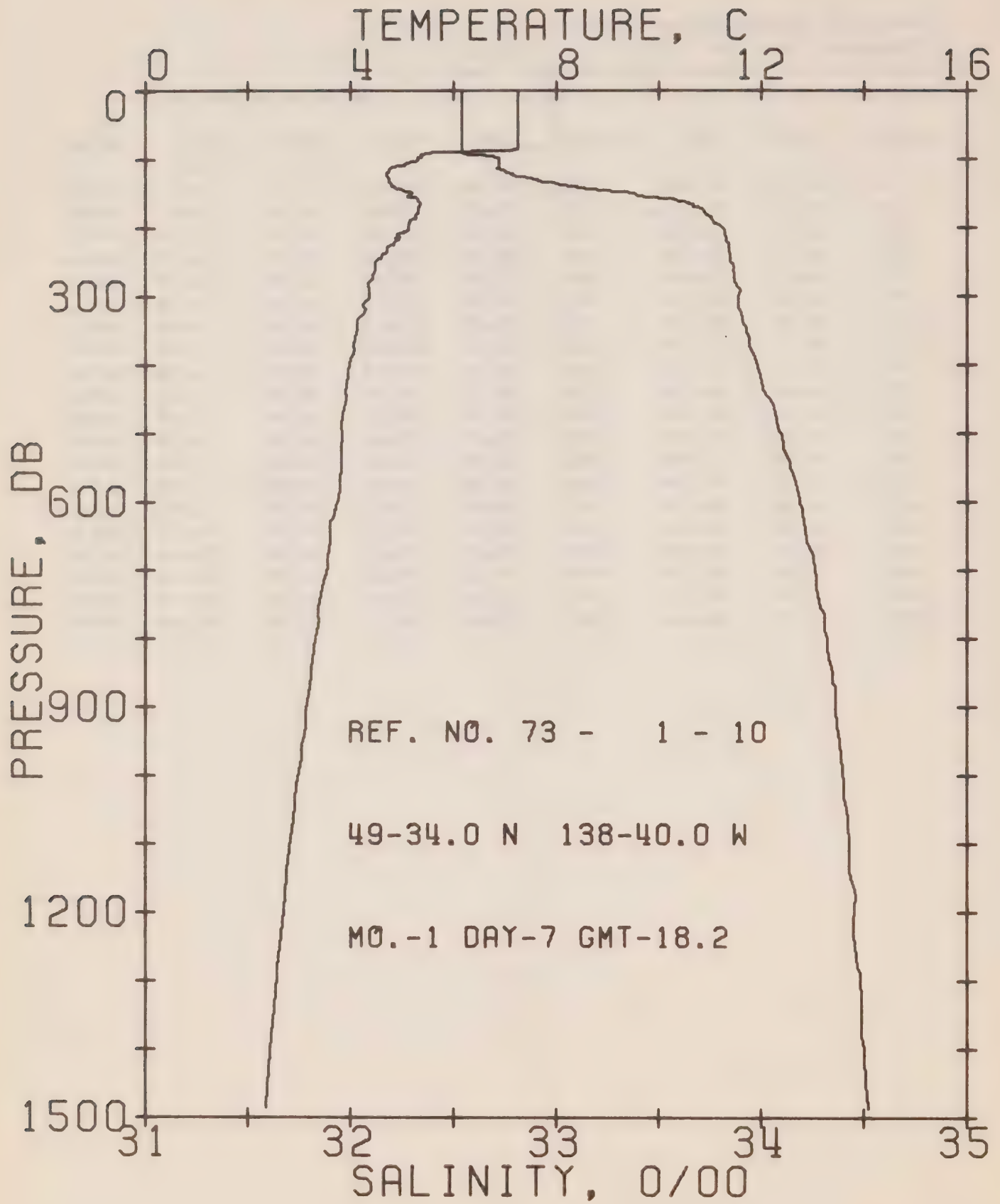
REFERENCE NO. 73- 1- 9

DATE 7/ 1/73

POSITION 49-26.0N, 136-40.0W GMT 12.3

RESULTS OF STP CAST 194 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.11	32.58	0	25.38	260.2	0.0	0.0	1480.
10	8.13	32.58	10	25.38	260.9	0.26	0.01	1480.
20	8.13	32.58	20	25.38	261.0	0.52	0.05	1481.
30	8.13	32.58	30	25.38	261.2	0.78	0.12	1481.
50	8.13	32.58	50	25.38	261.5	1.31	0.33	1481.
75	8.05	32.58	75	25.39	260.8	1.96	0.75	1481.
100	5.41	32.70	99	25.83	218.9	2.54	1.26	1471.
125	5.12	32.77	124	25.92	210.5	3.07	1.88	1471.
150	5.35	33.22	149	26.25	179.6	3.56	2.56	1473.
175	5.44	33.56	174	26.51	155.5	3.93	3.26	1474.
200	5.36	33.73	199	26.65	142.4	4.36	3.97	1474.
225	5.20	33.81	223	26.73	134.6	4.70	4.72	1474.
250	4.95	33.82	248	26.77	131.4	5.03	5.52	1473.
300	4.54	33.86	298	26.85	124.2	5.68	7.32	1472.
400	4.06	33.95	397	26.97	113.2	6.87	11.58	1472.
500	3.80	34.06	496	27.08	103.0	7.95	16.51	1473.
600	3.62	34.14	595	27.16	96.1	8.94	22.08	1474.
800	3.32	34.29	793	27.31	83.3	10.74	34.86	1476.
1000	3.00	34.38	990	27.42	74.2	12.31	49.23	1478.
1200	2.71	34.44	1188	27.49	67.7	13.72	65.03	1480.



OFFSHORE OCEANOGRAPHY GROUP

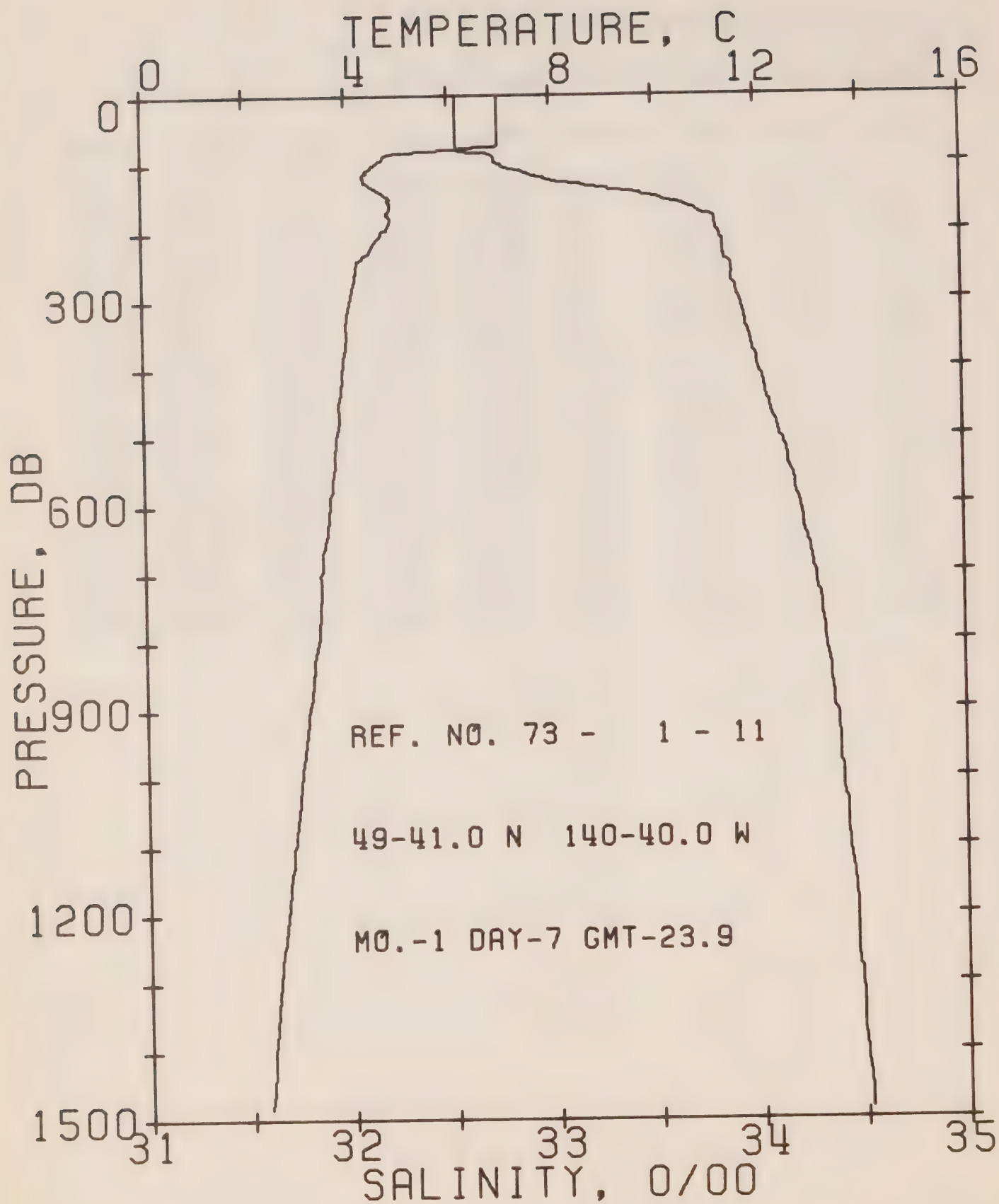
REFERENCE NO. 73- 1- 10

DATE 7/ 1/73

POSITION 49-34.0N, 138-40.0W GMT 18.2

RESULTS OF STP CAST 212 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.26	32.54	0	25.47	251.7	0.0	0.0	1477.
10	7.26	32.54	10	25.47	252.1	0.25	0.01	1477.
20	7.26	32.54	20	25.47	252.2	0.50	0.05	1477.
30	7.26	32.54	30	25.47	252.3	0.76	0.12	1477.
50	7.26	32.54	50	25.47	252.6	1.26	0.32	1478.
75	7.25	32.54	75	25.47	252.9	1.89	0.72	1478.
100	5.33	32.72	99	25.86	216.4	2.50	1.26	1471.
125	4.71	32.81	124	26.00	203.1	3.02	1.86	1469.
150	5.16	33.35	149	26.37	167.8	3.49	2.52	1472.
175	5.31	33.72	174	26.65	142.3	3.87	3.15	1473.
200	5.12	33.81	199	26.74	133.4	4.22	3.81	1473.
225	4.84	33.84	223	26.80	128.3	4.55	4.52	1472.
250	4.50	33.85	248	26.84	124.0	4.86	5.28	1471.
300	4.37	33.89	298	26.89	119.9	5.47	6.98	1472.
400	3.98	33.98	397	27.00	110.1	6.62	11.09	1472.
500	3.83	34.09	496	27.11	100.9	7.68	15.92	1473.
600	3.74	34.19	595	27.19	93.6	8.65	21.36	1474.
800	3.31	34.32	793	27.34	80.5	10.38	33.70	1476.
1000	2.97	34.40	990	27.43	72.6	11.91	47.71	1478.
1200	2.69	34.45	1188	27.50	66.5	13.30	63.23	1480.



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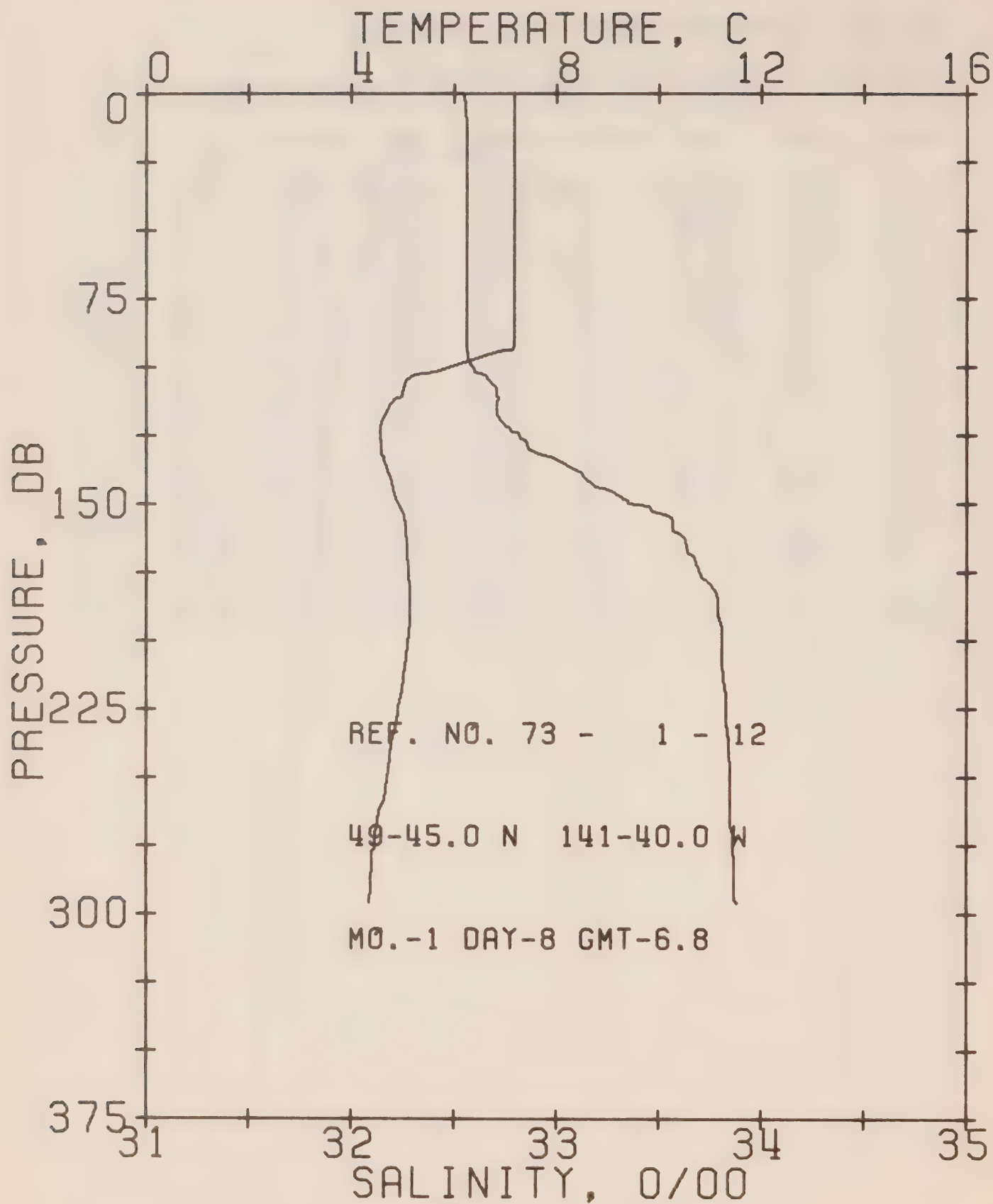
REFERENCE NO. 73- 1- 11

DATE 7/ 1/73

POSITION 49-41.0N, 140-40.0W GMT 23.9

RESULTS OF STP CAST 194 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.98	32.54	0	25.51	248.2	0.0	0.0	1476.
10	6.98	32.54	10	25.51	248.5	0.25	0.01	1476.
20	6.98	32.54	20	25.51	248.6	0.50	0.05	1476.
30	6.98	32.54	30	25.51	248.8	0.75	0.11	1476.
50	6.99	32.54	50	25.51	249.1	1.24	0.32	1477.
75	6.94	32.54	75	25.52	248.8	1.87	0.71	1477.
100	4.61	32.75	99	25.96	206.3	2.42	1.20	1468.
125	4.37	33.00	124	26.19	185.0	2.91	1.77	1468.
150	4.85	33.53	149	26.55	150.8	3.33	2.35	1471.
175	4.80	33.75	174	26.73	134.1	3.69	2.94	1471.
200	4.72	33.81	199	26.79	128.5	4.01	3.57	1472.
225	4.48	33.84	223	26.84	124.3	4.33	4.25	1471.
250	4.20	33.88	248	26.90	118.6	4.63	4.99	1470.
300	4.05	33.92	298	26.94	114.8	5.22	6.63	1471.
400	3.91	34.01	397	27.03	107.5	6.33	10.58	1472.
500	3.77	34.11	496	27.13	99.1	7.36	15.31	1473.
600	3.62	34.20	595	27.22	91.1	8.31	20.61	1474.
800	3.36	34.32	793	27.34	80.8	10.01	32.75	1476.
1000	3.01	34.40	990	27.43	72.7	11.54	46.73	1478.
1200	2.69	34.46	1188	27.51	66.0	12.93	62.23	1480.



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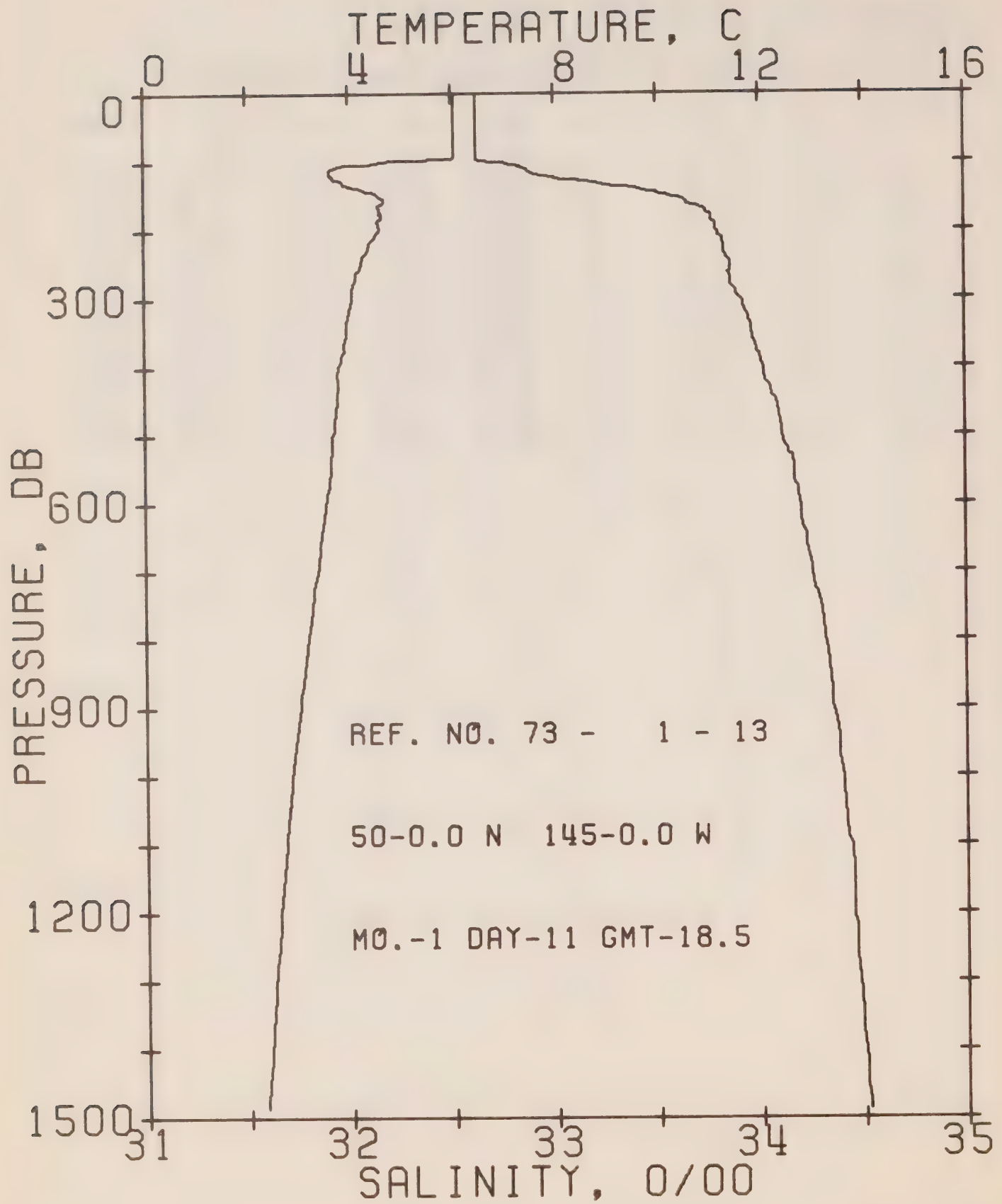
REFERENCE NO. 73- 1- 12

DATE 8/ 1/73

POSITION 49-45.0N, 141-40.0W GMT 6.8

RESULTS OF STP CAST 90 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.16	32.55	0	25.49	249.7	0.0	0.0	1476.
10	7.16	32.56	10	25.50	249.4	0.25	0.01	1477.
20	7.16	32.56	20	25.50	249.5	0.50	0.05	1477.
30	7.16	32.56	30	25.50	249.6	0.75	0.11	1477.
50	7.17	32.56	50	25.50	249.9	1.25	0.32	1477.
75	7.17	32.56	75	25.50	250.3	1.87	0.72	1478.
100	5.95	32.59	99	25.68	233.2	2.49	1.27	1473.
125	4.56	32.81	124	26.02	201.2	3.03	1.88	1468.
150	4.94	33.35	149	26.40	165.3	3.49	2.52	1471.
175	5.12	33.69	174	26.65	141.7	3.86	3.13	1473.
200	5.09	33.81	199	26.75	133.1	4.20	3.78	1473.
225	4.91	33.83	223	26.78	129.8	4.53	4.50	1473.
250	4.70	33.85	248	26.82	126.2	4.85	5.27	1472.



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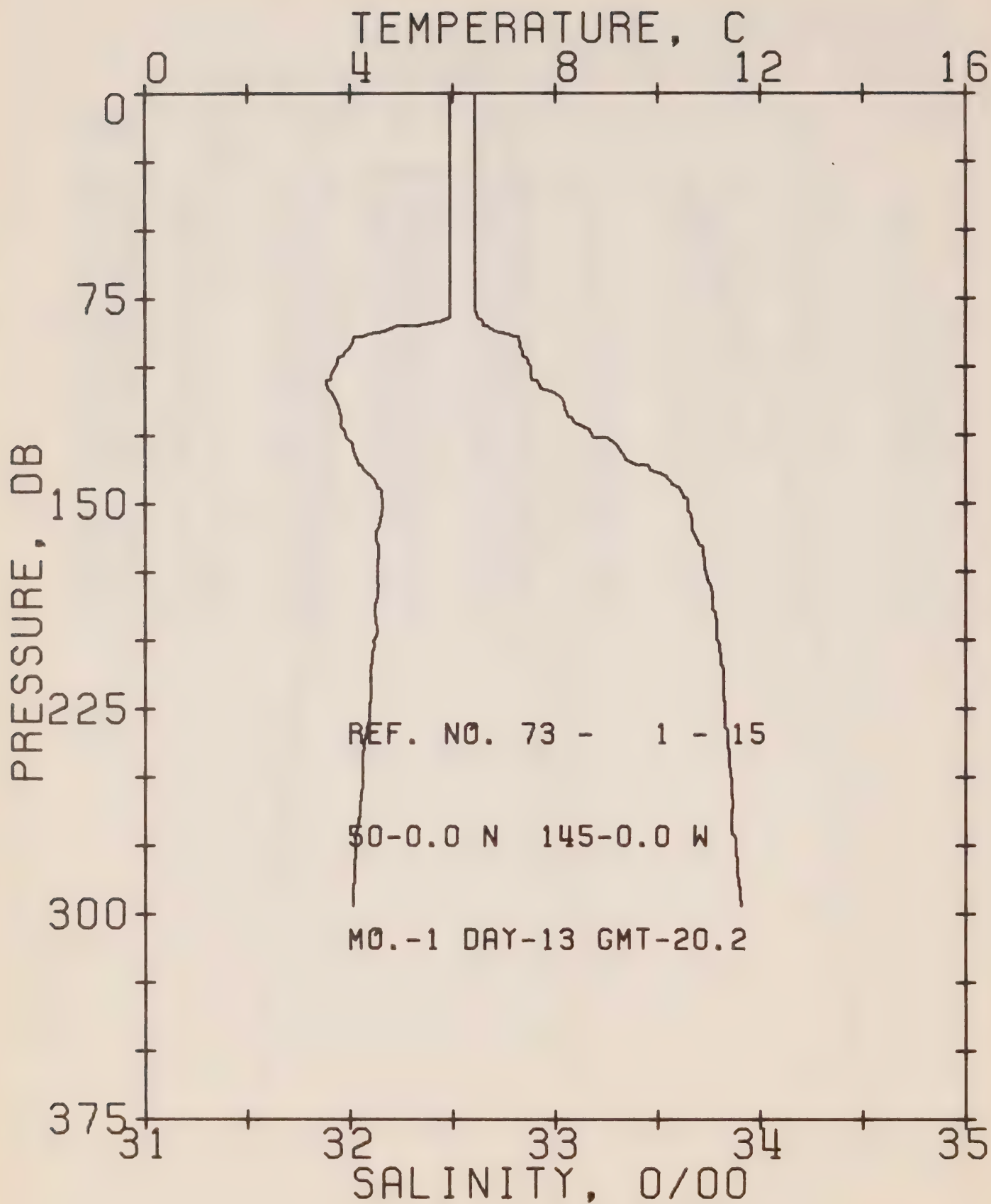
REFERENCE NO. 73- 1- 13

DATE 11/ 1/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.5

RESULTS OF STP CAST 176 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.06	32.62	0	25.69	230.9	0.0	0.0	1472.
10	6.06	32.62	10	25.69	231.3	0.23	0.01	1472.
20	6.06	32.62	20	25.69	231.4	0.46	0.05	1472.
30	6.06	32.62	30	25.69	231.5	0.69	0.11	1473.
50	6.06	32.62	50	25.69	231.7	1.16	0.30	1473.
75	6.06	32.62	75	25.69	232.0	1.74	0.66	1473.
100	4.68	32.70	99	25.91	210.9	2.31	1.18	1468.
125	3.74	33.05	124	26.29	175.4	2.79	1.72	1465.
150	4.58	33.55	149	26.60	146.0	3.18	2.27	1470.
175	4.60	33.75	174	26.75	131.9	3.53	2.84	1471.
200	4.60	33.79	199	26.79	129.1	3.85	3.46	1471.
225	4.48	33.83	223	26.84	124.0	4.17	4.15	1471.
250	4.23	33.86	248	26.88	120.5	4.47	4.89	1470.
300	4.05	33.90	298	26.94	115.6	5.07	6.55	1470.
400	3.30	34.02	397	27.05	105.2	6.17	10.48	1471.
500	3.66	34.11	496	27.14	97.8	7.18	15.12	1472.
600	3.53	34.20	595	27.22	90.7	8.12	20.37	1474.
800	3.16	34.32	793	27.35	79.4	9.82	32.47	1475.
1000	2.83	34.40	990	27.44	71.0	11.32	46.21	1477.
1200	2.60	34.45	1188	27.51	65.8	12.69	61.45	1480.



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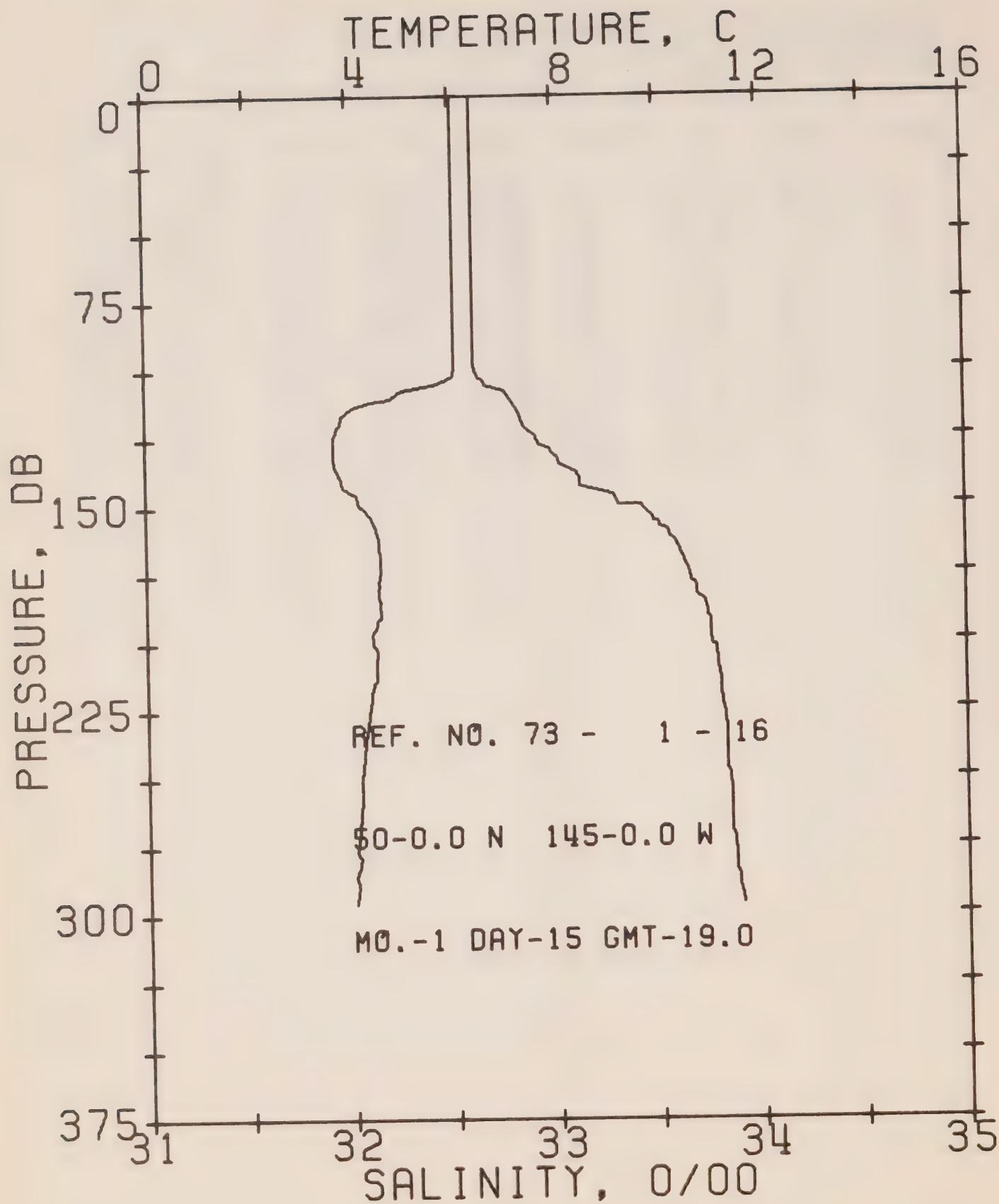
REFERENCE NO. 73- 1- 15

DATE 13/ 1/73

POSITION 50- 0.0N, 145- 0.0W GMT 20.2

RESULTS OF STP CAST 116 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.95	32.61	0	25.70	230.4	0.0	0.0	1472.
10	5.95	32.61	10	25.70	230.7	0.23	0.01	1472.
20	5.95	32.61	20	25.70	230.8	0.46	0.05	1472.
30	5.95	32.61	30	25.70	230.9	0.69	0.11	1472.
50	5.96	32.61	50	25.70	231.2	1.15	0.29	1473.
75	5.96	32.61	75	25.70	231.5	1.73	0.66	1473.
100	3.72	32.88	99	26.15	187.8	2.26	1.13	1464.
125	3.92	33.18	124	26.37	167.4	2.70	1.64	1466.
150	4.64	33.65	149	26.67	139.6	3.08	2.16	1470.
175	4.53	33.73	174	26.75	132.4	3.42	2.73	1470.
200	4.46	33.79	199	26.80	127.6	3.74	3.35	1470.
225	4.37	33.83	223	26.84	123.9	4.06	4.02	1471.
250	4.24	33.86	248	26.88	120.7	4.36	4.76	1470.



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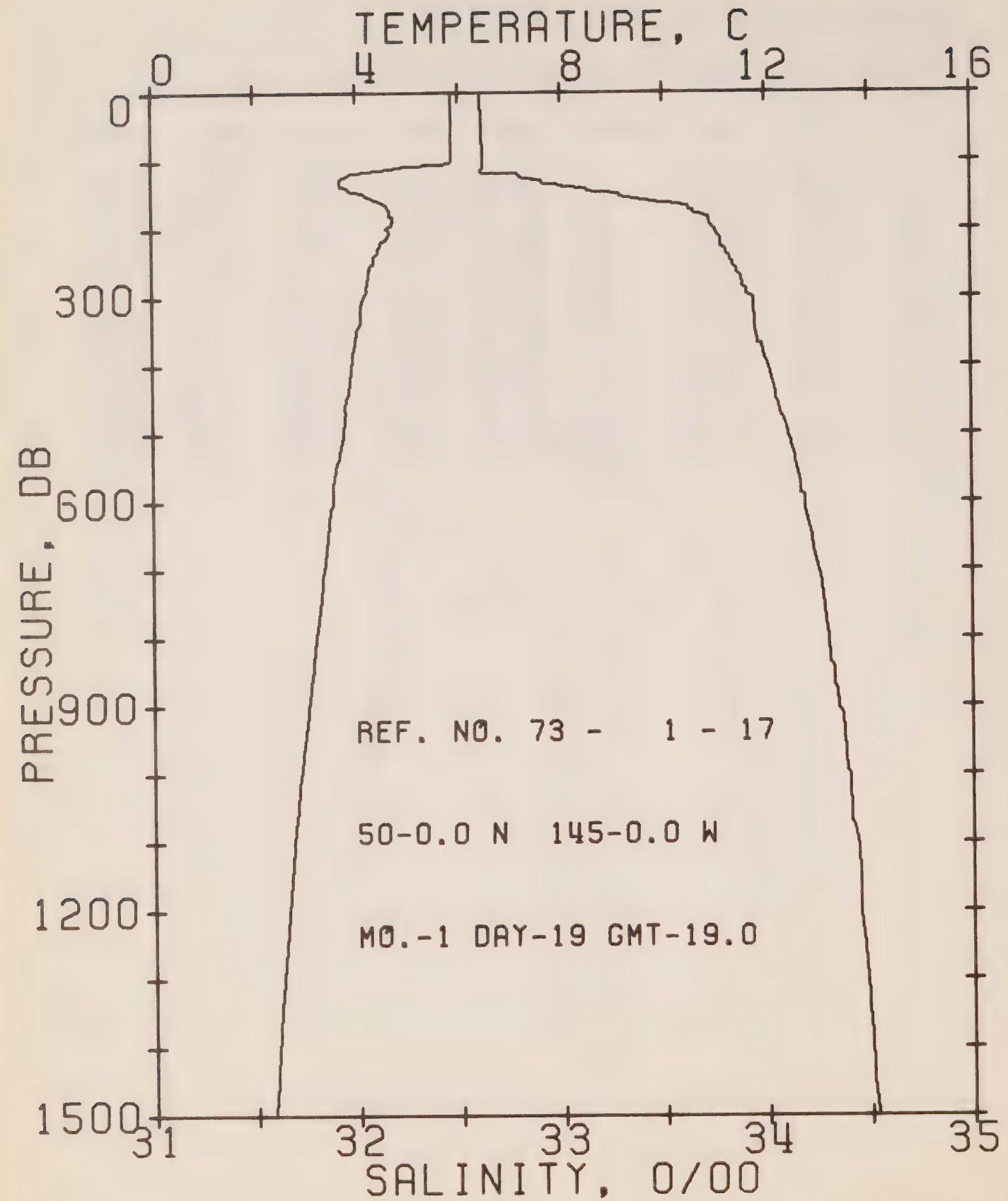
REFERENCE NO. 73- 1- 16

DATE 15/ 1/73

POSITION 50- 0.0N, 145- 0.0W GMT 19.0

RESULTS OF STP CAST 97 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.06	32.61	0	25.68	231.7	0.0	0.0	1472.
10	6.06	32.61	10	25.68	232.0	0.23	0.01	1472.
20	6.06	32.61	20	25.68	232.1	0.46	0.05	1472.
30	6.06	32.61	30	25.68	232.2	0.70	0.11	1473.
50	6.06	32.61	50	25.68	232.4	1.16	0.30	1473.
75	6.06	32.61	75	25.68	232.7	1.74	0.67	1473.
100	6.05	32.61	99	25.69	232.6	2.32	1.19	1474.
125	3.69	32.91	124	26.18	185.5	2.84	1.77	1465.
150	4.13	33.31	149	26.45	160.3	3.27	2.38	1468.
175	4.58	33.65	174	26.68	139.1	3.64	2.98	1470.
200	4.42	33.75	199	26.78	129.9	3.97	3.62	1470.
225	4.34	33.81	223	26.83	124.7	4.29	4.31	1470.
250	4.17	33.84	248	26.87	121.1	4.59	5.05	1470.



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REFERENCE NO. 73- 1- 17

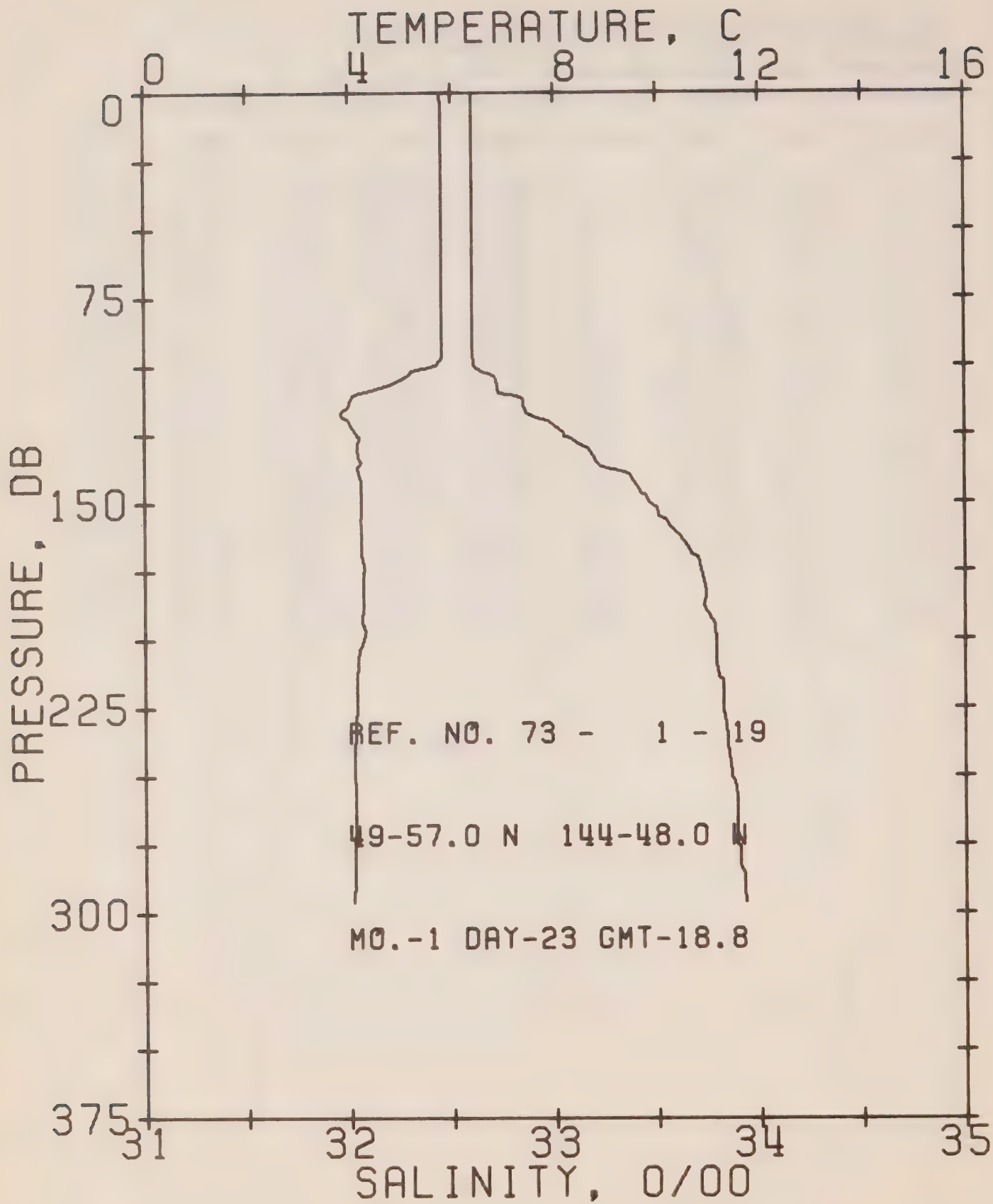
DATE 19/ 1/73

POSITION 50- 0.0N, 145- 0.0W

GMT 19.0

RESULTS OF STP CAST 166 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.88	32.61	0	25.71	229.6	0.0	0.0	1471.
10	5.88	32.61	10	25.71	229.8	0.23	0.01	1472.
20	5.88	32.61	20	25.71	229.8	0.46	0.05	1472.
30	5.88	32.61	30	25.71	229.8	0.69	0.11	1472.
50	5.88	32.61	50	25.71	229.9	1.15	0.29	1472.
75	5.87	32.62	75	25.71	230.0	1.72	0.66	1473.
100	5.87	32.62	99	25.71	230.1	2.30	1.17	1473.
125	3.71	32.93	124	26.12	191.6	2.83	1.78	1465.
150	4.19	33.29	149	26.43	161.9	3.28	2.40	1468.
175	4.66	33.65	174	26.67	140.1	3.65	3.02	1471.
200	4.60	33.75	199	26.75	132.5	3.99	3.67	1471.
225	4.45	33.78	223	26.79	128.6	4.32	4.38	1471.
250	4.34	33.84	248	26.85	123.0	4.63	5.14	1471.
300	4.13	33.93	298	26.95	114.4	5.23	6.80	1471.
400	3.91	34.01	397	27.03	107.2	6.34	10.77	1472.
500	3.74	34.11	496	27.13	98.7	7.37	15.49	1473.
600	3.51	34.19	595	27.22	91.1	8.32	20.79	1474.
800	3.18	34.30	793	27.33	80.7	10.03	32.96	1476.
1000	2.86	34.40	990	27.44	71.2	11.55	46.86	1478.
1200	2.63	34.45	1188	27.50	66.0	12.91	62.15	1480.



OFFSHORE OCEANOGRAPHY GROUP

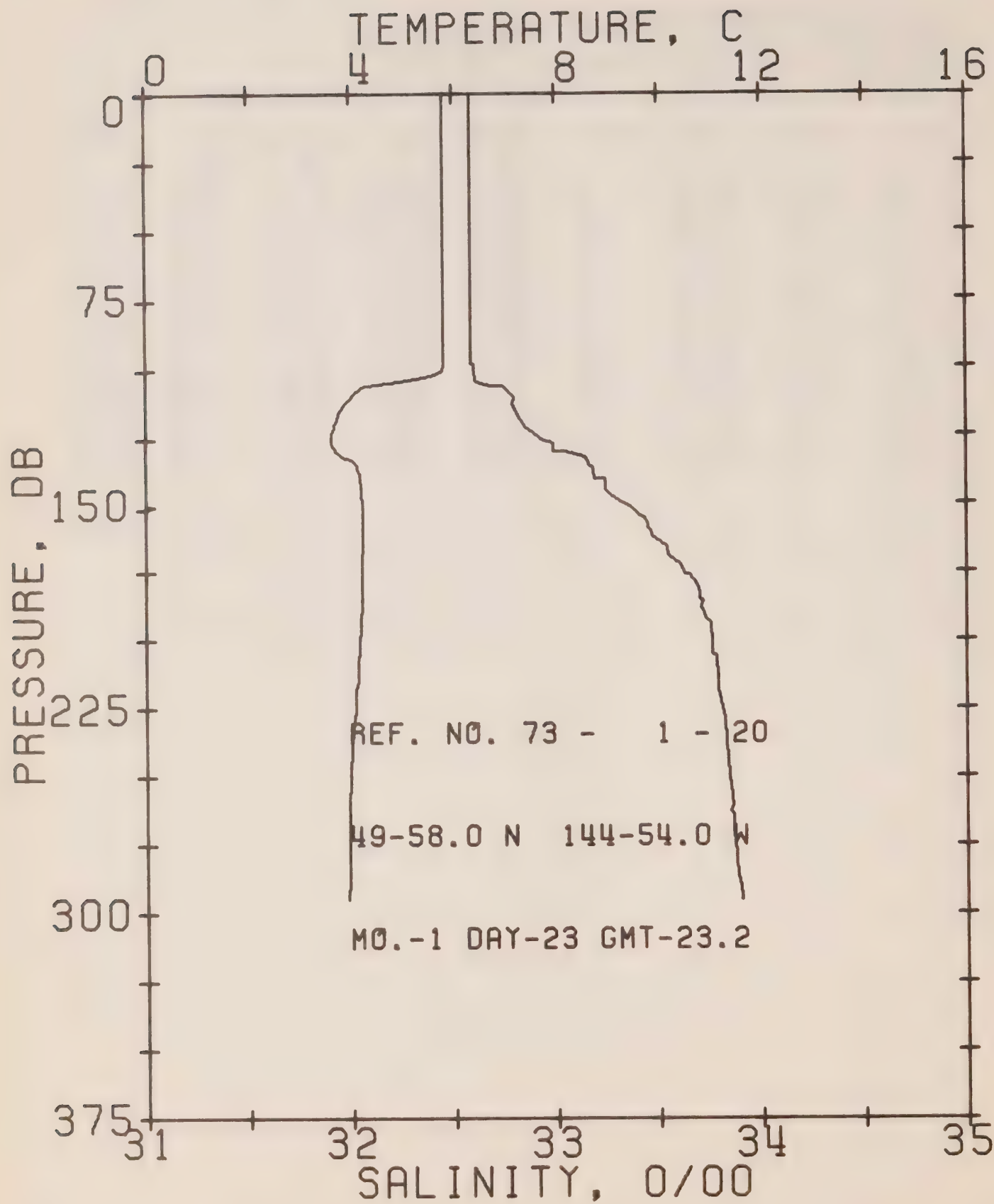
REFERENCE NO. 73- 1- 19

DATE 23/ 1/73

POSITION 49-57.0N, 144-48.0W GMT 18.8

RESULTS OF STP CAST 83 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.79	32.60	0	25.71	229.3	0.0	0.0	1471.
10	5.80	32.60	10	25.71	229.7	0.23	0.01	1471.
20	5.80	32.60	20	25.71	229.8	0.46	0.05	1471.
30	5.80	32.60	30	25.71	229.9	0.69	0.11	1472.
50	5.80	32.60	50	25.71	230.1	1.15	0.29	1472.
75	5.80	32.60	75	25.71	230.4	1.72	0.66	1472.
100	5.68	32.61	99	25.73	228.6	2.30	1.17	1472.
125	4.17	33.05	124	26.24	179.6	2.80	1.74	1467.
150	4.23	33.46	149	26.56	149.5	3.21	2.31	1468.
175	4.28	33.71	174	26.76	131.2	3.55	2.88	1469.
200	4.28	33.79	199	26.82	125.7	3.87	3.50	1470.
225	4.13	33.82	223	26.86	122.3	4.18	4.17	1470.
250	4.09	33.86	248	26.90	118.9	4.48	4.90	1470.



OFFSHORE OCEANOGRAPHY GROUP

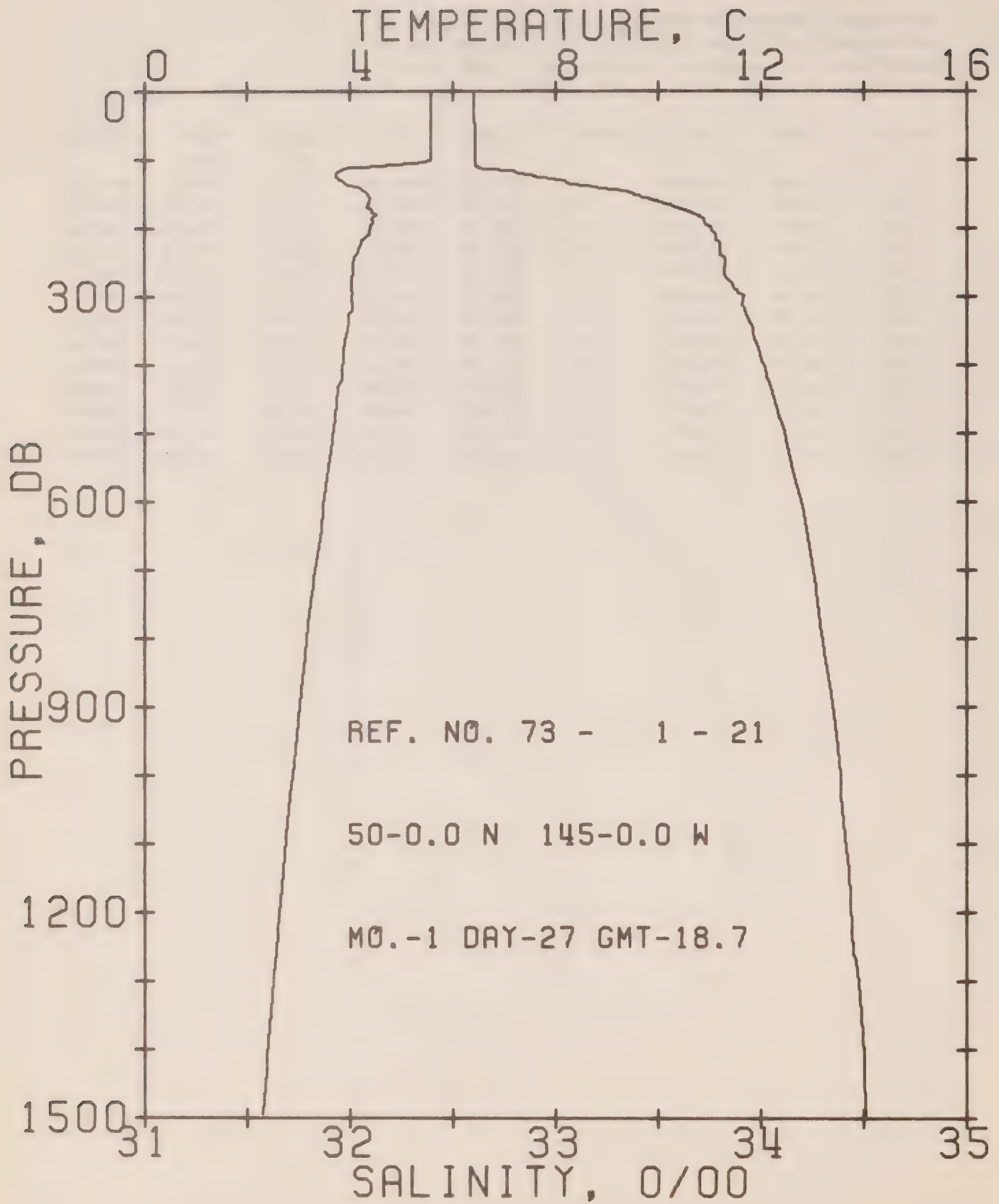
REFERENCE NO. 73- 1- 20

DATE 23/ 1/73

POSITION 49-58.0N, 144-54.0W GMT 23.2

RESULTS OF STP CAST 82 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.82	32.59	0	25.70	230.4	0.0	0.0	1471.
10	5.81	32.59	10	25.70	230.6	0.23	0.01	1471.
20	5.81	32.59	20	25.70	230.6	0.46	0.05	1471.
30	5.81	32.59	30	25.70	230.7	0.69	0.11	1472.
50	5.81	32.59	50	25.70	231.0	1.15	0.29	1472.
75	5.80	32.59	75	25.70	231.2	1.73	0.66	1472.
100	5.79	32.60	99	25.71	230.6	2.31	1.18	1473.
125	3.62	32.91	124	26.18	185.1	2.82	1.76	1464.
150	4.23	33.33	149	26.46	159.0	3.24	2.35	1468.
175	4.21	33.62	174	26.69	137.4	3.61	2.96	1469.
200	4.17	33.76	199	26.81	126.8	3.94	3.59	1469.
225	4.07	33.81	223	26.86	122.3	4.25	4.26	1469.
250	3.97	33.84	248	26.89	119.2	4.55	4.99	1469.



OFFSHORE OCEANOGRAPHY GROUP

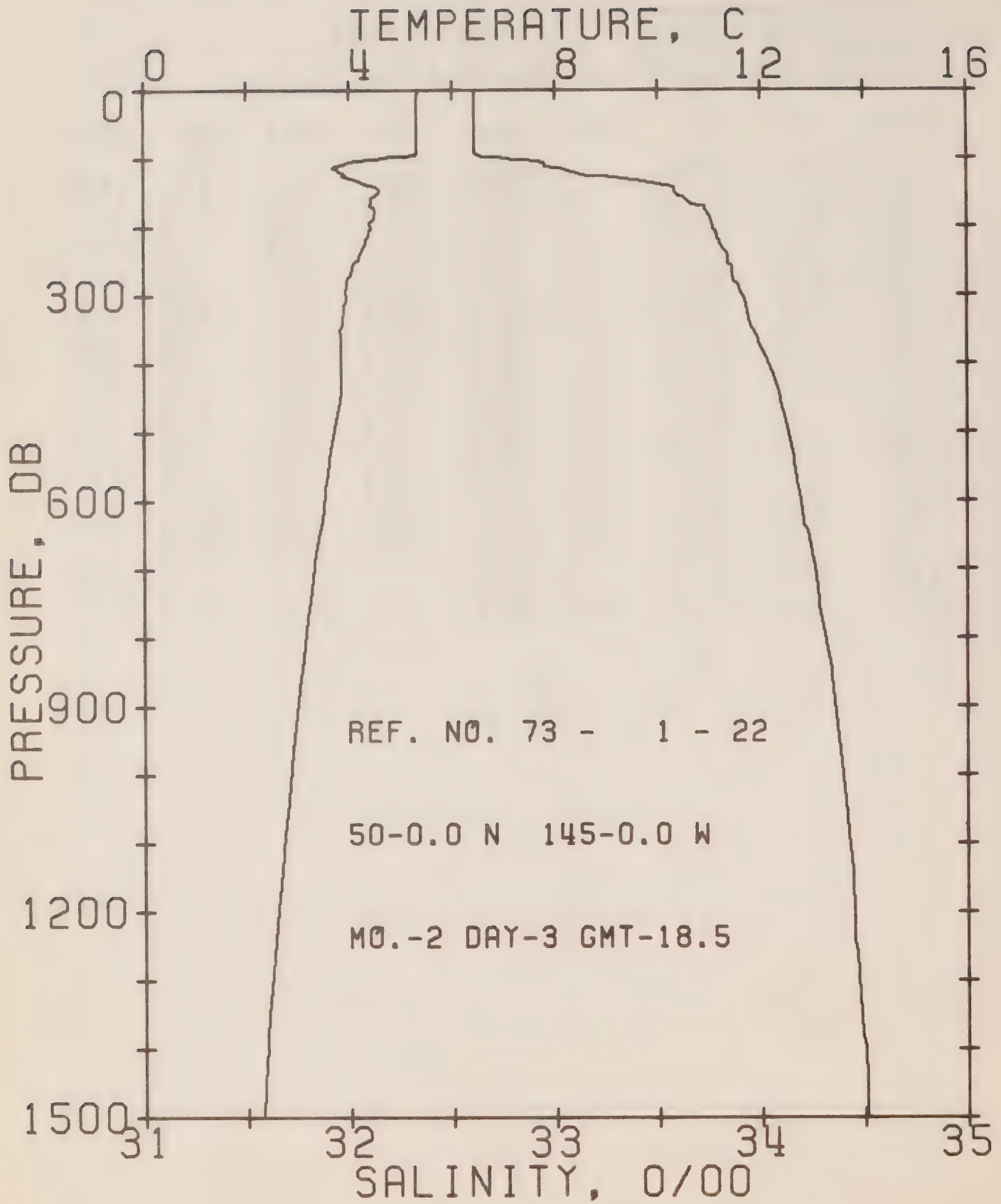
REFERENCE NO. 73- 1- 21

DATE 27/ 1/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.7

RESULTS OF STP CAST 117 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.58	32.60	0	25.73	226.9	0.0	0.0	1470.
10	5.58	32.60	10	25.73	227.2	0.23	0.01	1470.
20	5.58	32.60	20	25.74	227.2	0.45	0.05	1471.
30	5.58	32.60	30	25.74	227.2	0.68	0.10	1471.
50	5.58	32.61	50	25.74	227.2	1.14	0.29	1471.
75	5.58	32.61	75	25.74	227.3	1.70	0.65	1471.
100	5.58	32.61	99	25.74	227.4	2.27	1.16	1472.
125	3.73	32.90	124	26.17	186.4	2.79	1.75	1465.
150	4.33	33.37	149	26.48	157.3	3.22	2.35	1468.
175	4.41	33.64	174	26.69	138.2	3.59	2.96	1470.
200	4.39	33.75	199	26.78	129.7	3.93	3.60	1470.
225	4.19	33.80	223	26.84	124.4	4.24	4.29	1470.
250	4.05	33.83	248	26.88	120.8	4.55	5.03	1470.
300	4.02	33.92	298	26.95	114.3	5.15	6.71	1470.
400	3.84	34.01	397	27.04	106.3	6.26	10.66	1471.
500	3.66	34.11	496	27.14	97.5	7.28	15.32	1472.
600	3.49	34.19	595	27.22	90.5	8.22	20.60	1473.
800	3.15	34.30	793	27.34	80.5	9.92	32.71	1475.
1000	2.87	34.39	990	27.43	72.0	11.44	46.62	1478.
1200	2.63	34.44	1188	27.49	67.0	12.83	62.18	1480.



OFFSHORE OCEANOGRAPHY GROUP

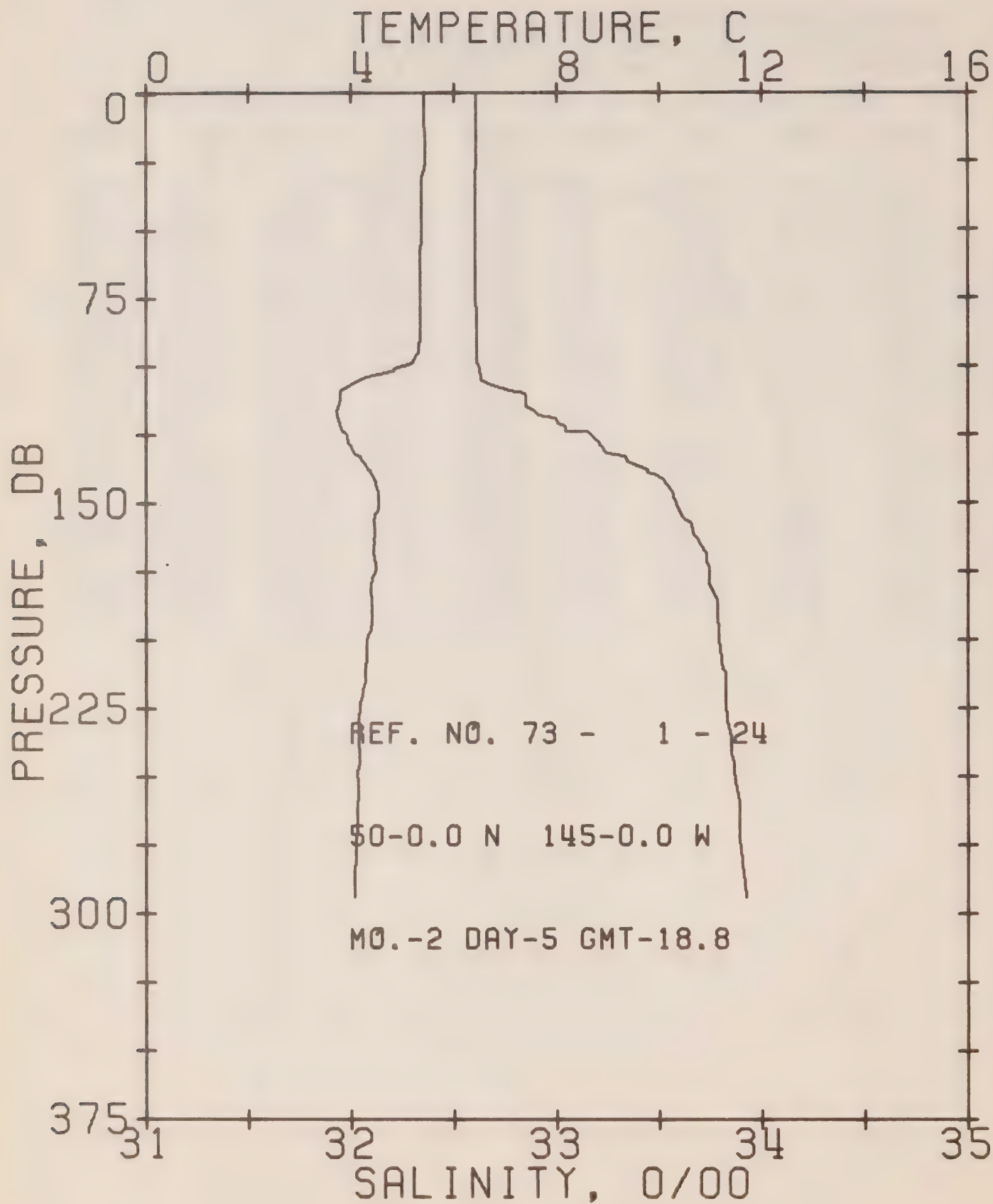
REFERENCE NO. 73- 1- 22

DATE 3/ 2/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.5

RESULTS OF STP CAST 128 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.33	32.61	0	25.77	223.4	0.0	0.0	1469.
10	5.31	32.61	10	25.77	223.5	0.22	0.01	1469.
20	5.31	32.61	20	25.77	223.6	0.45	0.05	1469.
30	5.31	32.61	30	25.77	223.7	0.67	0.10	1470.
50	5.31	32.61	50	25.77	223.9	1.12	0.29	1470.
75	5.32	32.61	75	25.77	224.3	1.68	0.64	1470.
100	4.67	32.75	99	25.95	207.0	2.24	1.14	1468.
125	3.95	33.16	124	26.35	169.1	2.69	1.66	1466.
150	4.58	33.58	149	26.62	144.2	3.07	2.19	1470.
175	4.50	33.73	174	26.75	132.4	3.41	2.76	1470.
200	4.42	33.77	199	26.79	128.8	3.74	3.38	1470.
225	4.30	33.80	223	26.83	125.5	4.06	4.07	1470.
250	4.14	33.84	248	26.87	121.0	4.36	4.81	1470.
300	3.94	33.91	298	26.95	114.2	4.95	6.46	1470.
400	3.83	34.04	397	27.06	104.2	6.05	10.35	1471.
500	3.69	34.13	496	27.15	96.5	7.05	14.95	1473.
600	3.50	34.20	595	27.22	90.5	7.98	20.18	1473.
800	3.13	34.31	793	27.35	79.5	9.68	32.23	1475.
1000	2.84	34.39	990	27.44	71.3	11.18	45.97	1477.
1200	2.58	34.45	1188	27.51	65.7	12.54	61.25	1480.



OFFSHORE OCEANOGRAPHY GROUP

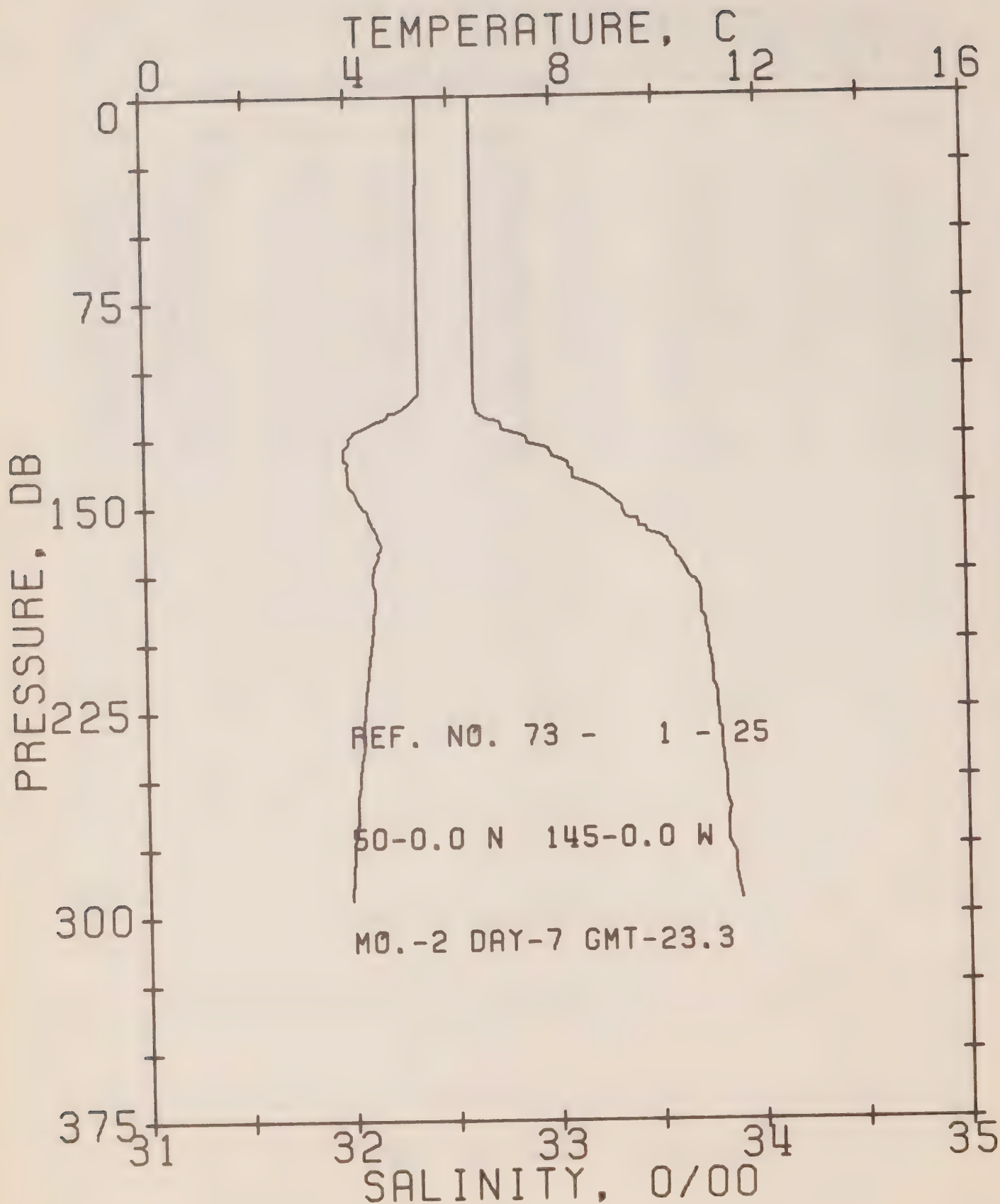
REFERENCE NO. 73- 1- 24

DATE 5/ 2/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.8

RESULTS OF STP CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.42	32.61	0	25.76	224.4	0.0	0.0	1470.
10	5.42	32.61	10	25.76	224.7	0.22	0.01	1470.
20	5.43	32.61	20	25.76	224.9	0.45	0.05	1470.
30	5.38	32.60	30	25.76	225.1	0.67	0.10	1470.
50	5.35	32.60	50	25.76	225.1	1.12	0.29	1470.
75	5.33	32.60	75	25.77	224.8	1.69	0.65	1470.
100	5.01	32.61	99	25.81	220.7	2.25	1.15	1470.
125	3.92	33.16	124	26.36	168.8	2.73	1.70	1466.
150	4.53	33.58	149	26.63	143.7	3.12	2.24	1470.
175	4.46	33.74	174	26.76	131.2	3.46	2.80	1470.
200	4.30	33.79	199	26.82	126.0	3.78	3.42	1470.
225	4.15	33.82	223	26.86	122.2	4.09	4.09	1470.
250	4.11	33.86	248	26.90	118.9	4.39	4.82	1470.



OFFSHORE OCEANOGRAPHY GROUP

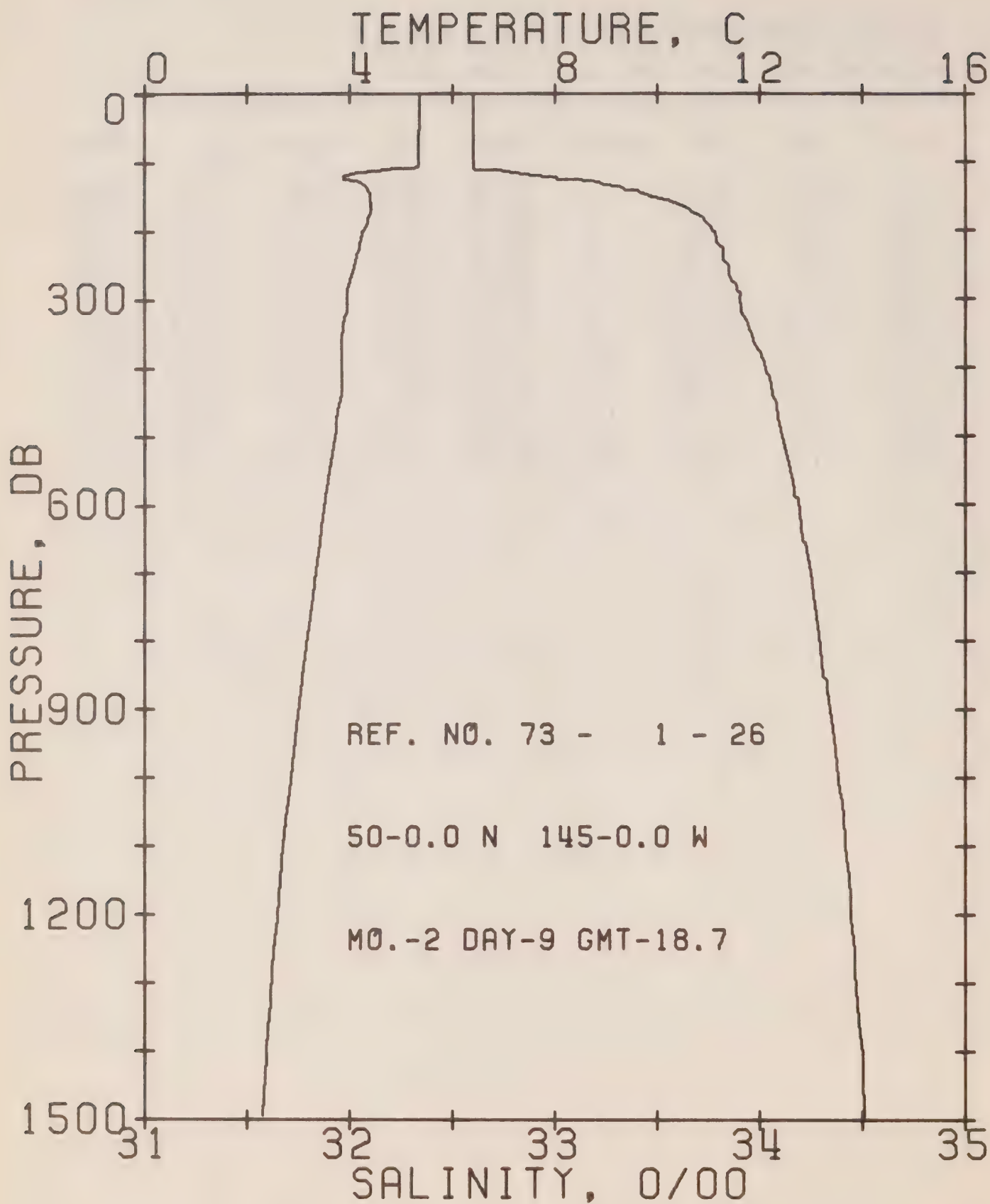
REFERENCE NO. 73- 1- 25

DATE 7/ 2/73

POSITION 50- 0.0N, 145- 0.0W GMT 23.3

RESULTS OF STP CAST 80 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.40	32.61	0	25.76	224.1	0.0	0.0	1469.
10	5.40	32.61	10	25.76	224.5	0.22	0.01	1470.
20	5.39	32.61	20	25.76	224.5	0.45	0.05	1470.
30	5.39	32.61	30	25.76	224.6	0.67	0.10	1470.
50	5.38	32.61	50	25.77	224.7	1.12	0.29	1470.
75	5.37	32.61	75	25.77	224.8	1.68	0.64	1471.
100	5.37	32.61	99	25.77	225.1	2.25	1.15	1471.
125	4.00	32.86	124	26.11	192.2	2.79	1.77	1466.
150	4.23	33.32	149	26.45	160.1	3.23	2.38	1468.
175	4.43	33.64	174	26.69	138.1	3.60	2.99	1470.
200	4.40	33.74	199	26.77	130.7	3.93	3.63	1470.
225	4.24	33.78	223	26.82	126.0	4.25	4.33	1470.
250	4.12	33.82	248	26.86	122.3	4.57	5.08	1470.



OFFSHORE OCEANOGRAPHY GROUP

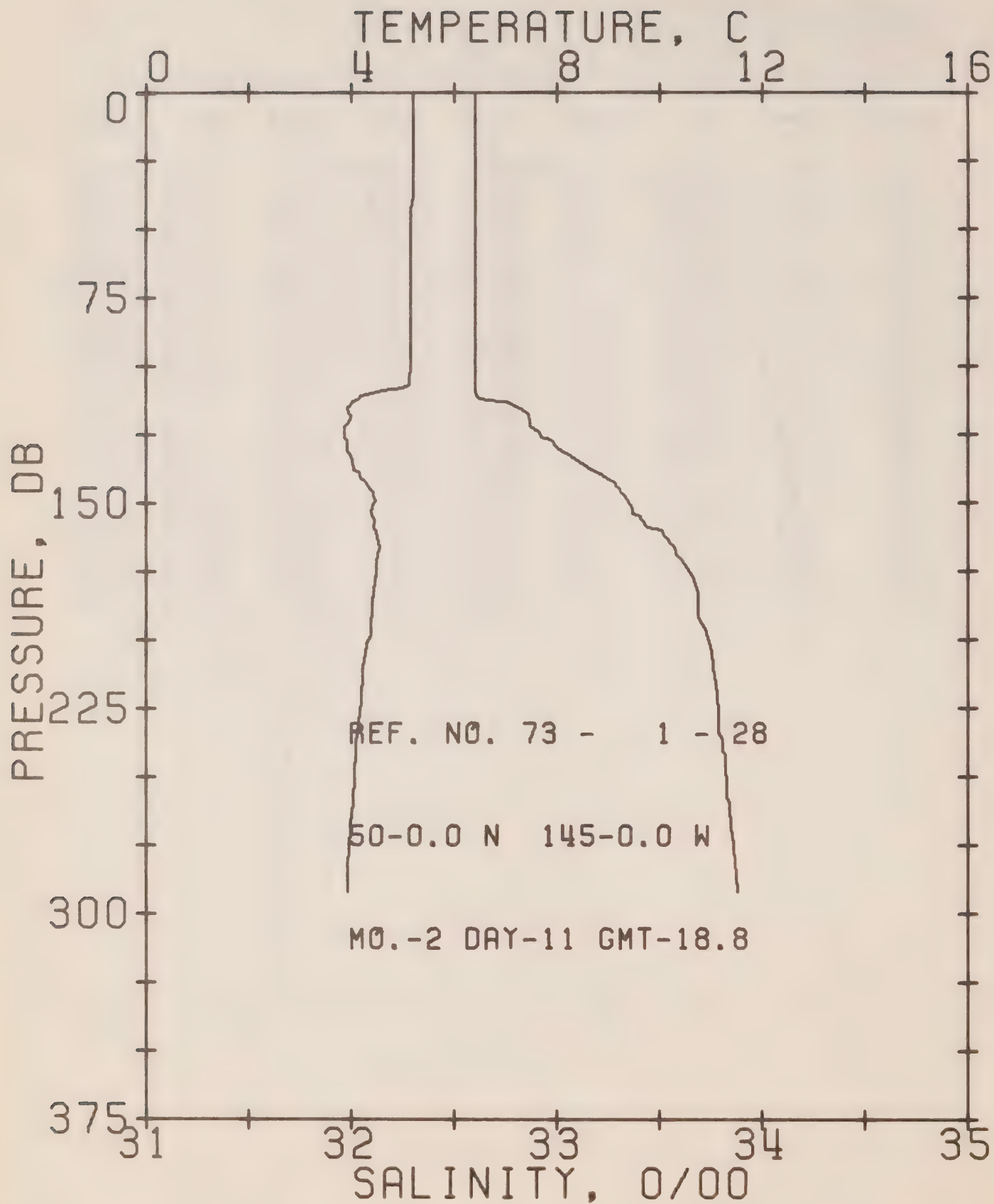
REFERENCE NO. 73- 1- 26

DATE 9/ 2/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.7

RESULTS OF STP CAST 116 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.35	32.60	0	25.76	224.4	0.0	0.0	1469.
10	5.35	32.60	10	25.76	224.7	0.22	0.01	1469.
20	5.35	32.60	20	25.76	224.7	0.45	0.05	1470.
30	5.35	32.60	30	25.76	224.8	0.67	0.10	1470.
50	5.35	32.60	50	25.76	225.0	1.12	0.29	1470.
75	5.34	32.60	75	25.76	225.3	1.69	0.65	1470.
100	5.34	32.60	99	25.76	225.4	2.25	1.15	1471.
125	3.86	33.01	124	26.24	179.6	2.77	1.74	1466.
150	4.40	33.46	149	26.55	151.3	3.18	2.31	1469.
175	4.40	33.69	174	26.73	134.3	3.53	2.89	1470.
200	4.27	33.77	199	26.80	127.4	3.86	3.52	1470.
225	4.18	33.82	223	26.85	122.6	4.17	4.20	1470.
250	4.09	33.84	248	26.88	120.6	4.48	4.94	1470.
300	3.95	33.90	298	26.94	114.7	5.06	6.58	1470.
400	3.83	34.02	397	27.05	105.2	6.17	10.50	1471.
500	3.72	34.11	496	27.13	98.6	7.18	15.17	1473.
600	3.52	34.19	595	27.22	91.0	8.13	20.47	1474.
800	3.17	34.29	793	27.33	81.2	9.85	32.73	1475.
1000	2.85	34.38	990	27.43	72.3	11.39	46.75	1478.
1200	2.59	34.44	1188	27.50	66.3	12.76	62.15	1480.



OFFSHORE OCEANOGRAPHY GROUP

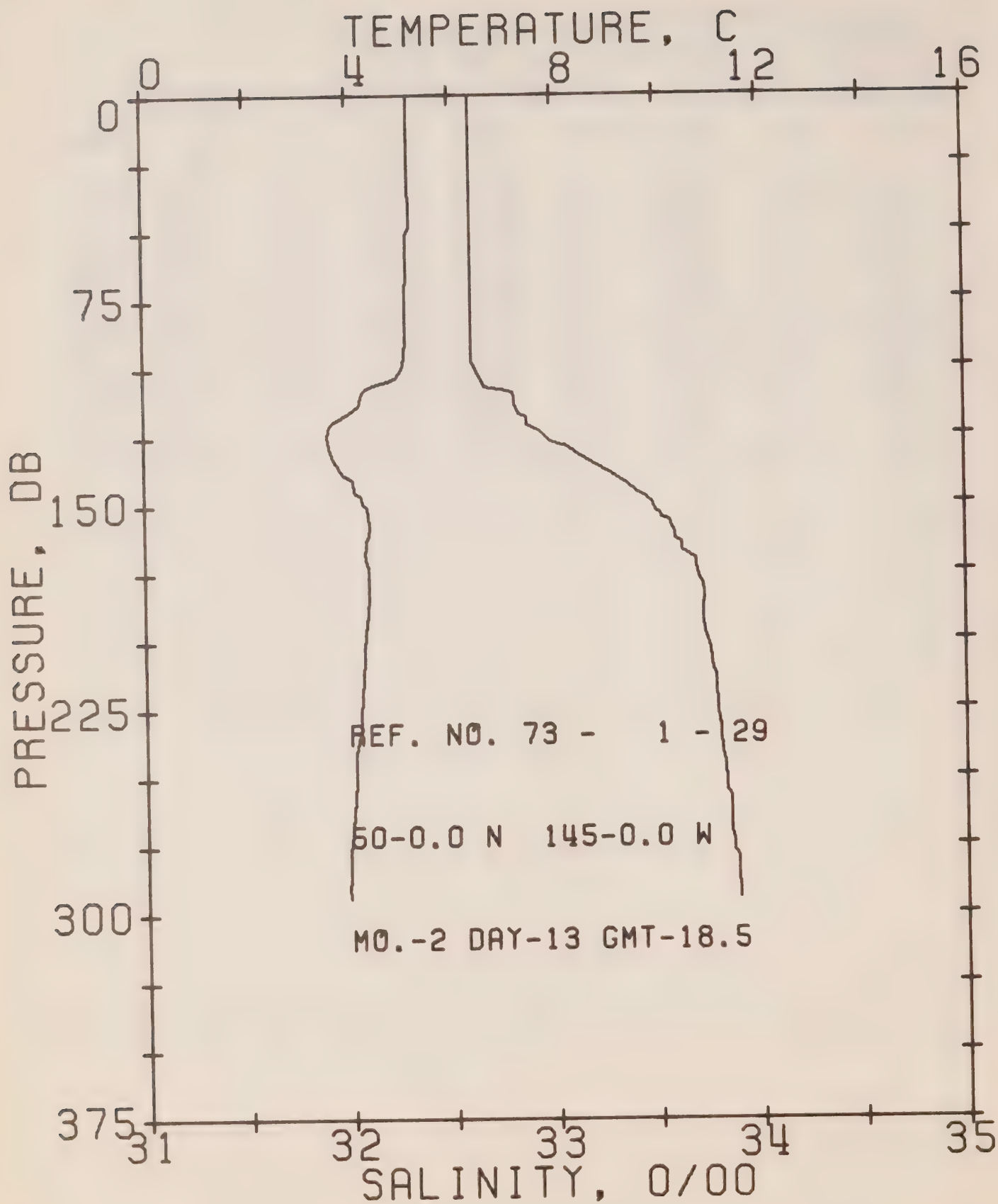
REFERENCE NO. 73- 1- 28

DATE 11/ 2/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.8

RESULTS OF STP CAST 90 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.21	32.60	0	25.78	222.9	0.0	0.0	1469.
10	5.21	32.60	10	25.78	223.1	0.22	0.01	1469.
20	5.20	32.60	20	25.78	223.2	0.45	0.05	1469.
30	5.20	32.60	30	25.78	223.3	0.67	0.10	1469.
50	5.16	32.60	50	25.78	223.0	1.12	0.28	1469.
75	5.15	32.60	75	25.78	223.1	1.67	0.64	1470.
100	5.14	32.60	99	25.78	223.3	2.23	1.14	1470.
125	3.87	32.91	124	26.17	186.8	2.75	1.73	1466.
150	4.42	33.35	149	26.46	159.8	3.13	2.33	1469.
175	4.48	33.64	174	26.68	138.6	3.55	2.94	1470.
200	4.32	33.74	199	26.77	130.2	3.88	3.58	1470.
225	4.17	33.79	223	26.83	125.1	4.20	4.27	1470.
250	4.05	33.82	248	26.87	121.2	4.51	5.01	1470.



OFFSHORE OCEANOGRAPHY GROUP

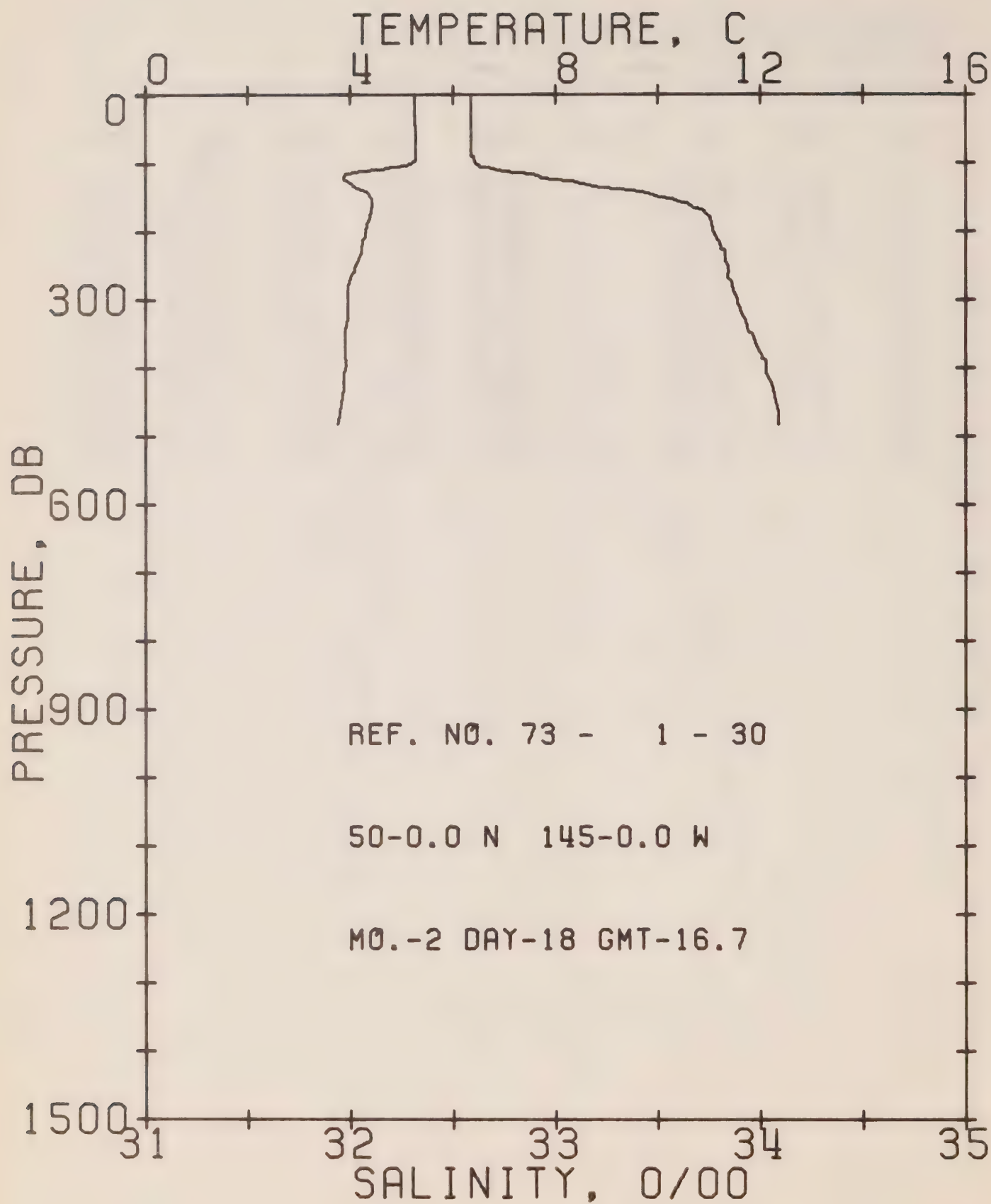
REFERENCE NO. 73- 1- 29

DATE 13/ 2/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.5

RESULTS OF STP CAST 84 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.19	32.60	0	25.78	222.7	0.0	0.0	1469.
10	5.19	32.60	10	25.78	223.0	0.22	0.01	1469.
20	5.20	32.60	20	25.78	223.1	0.45	0.05	1469.
30	5.20	32.60	30	25.78	223.3	0.67	0.10	1469.
50	5.18	32.60	50	25.78	223.2	1.12	0.28	1469.
75	5.14	32.60	75	25.78	223.0	1.67	0.64	1470.
100	5.04	32.62	99	25.81	220.9	2.23	1.14	1470.
125	3.59	32.95	124	26.22	181.3	2.73	1.71	1464.
150	4.30	33.48	149	26.57	148.7	3.14	2.28	1469.
175	4.37	33.59	174	26.74	133.6	3.49	2.86	1470.
200	4.28	33.74	199	26.78	129.6	3.82	3.49	1470.
225	4.20	33.79	223	26.83	125.2	4.14	4.17	1470.
250	4.07	33.83	248	26.87	121.4	4.44	4.92	1470.



OFFSHORE OCEANOGRAPHY GROUP

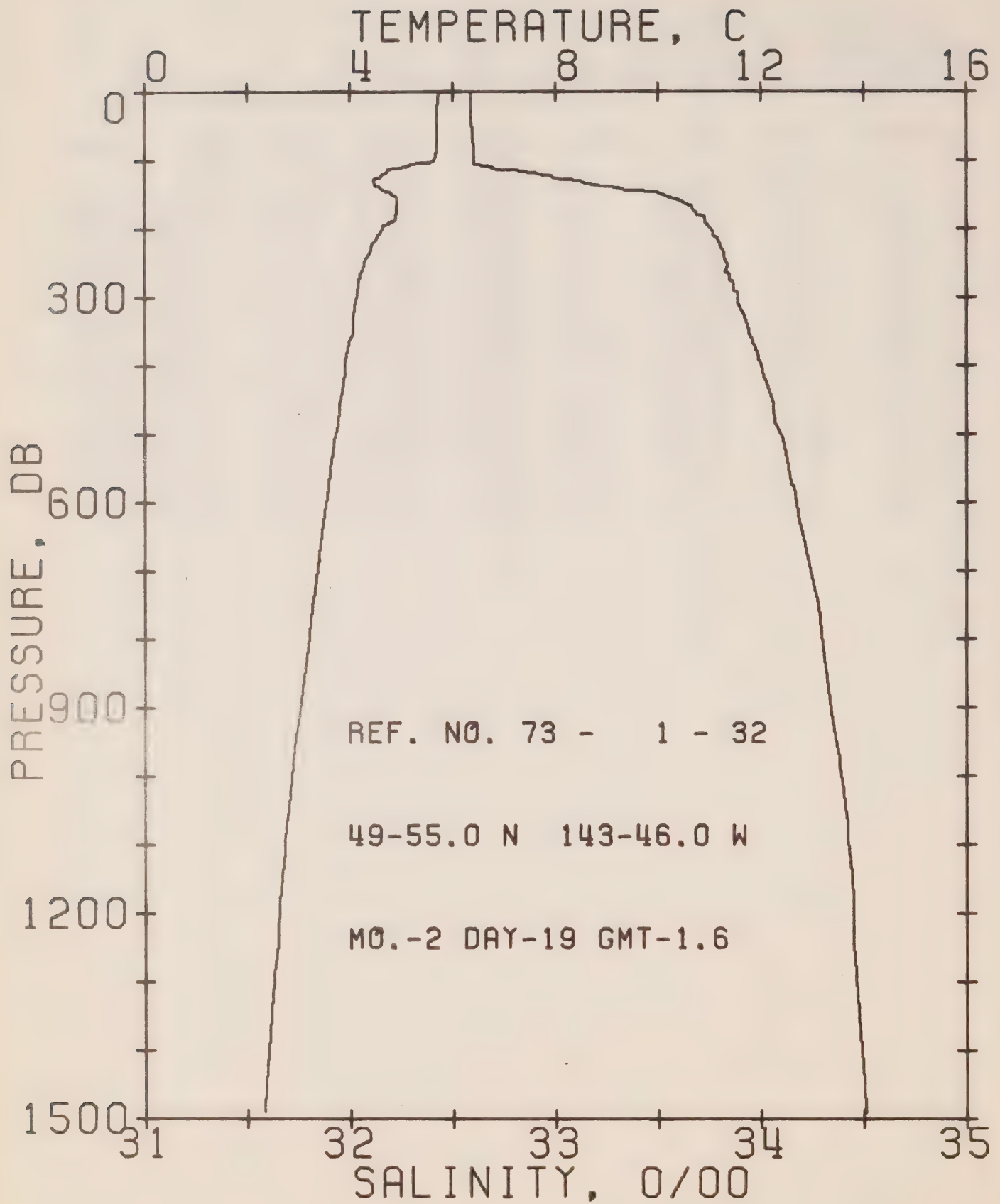
REFERENCE NO. 73- 1- 30

DATE 18/ 2/73

POSITION 50- 0.0N. 145- 0.0W GMT 16.7

RESULTS OF STP CAST 92 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.26	32.59	0	25.76	224.1	0.0	0.0	1469.
10	5.26	32.59	10	25.76	224.4	0.22	0.01	1469.
20	5.26	32.59	20	25.76	224.5	0.45	0.05	1469.
30	5.26	32.59	30	25.76	224.7	0.67	0.10	1469.
50	5.27	32.59	50	25.76	224.9	1.12	0.29	1470.
75	5.27	32.59	75	25.76	225.2	1.69	0.64	1470.
100	5.21	32.61	99	25.78	223.3	2.25	1.15	1470.
125	3.88	33.03	124	26.26	177.8	2.75	1.72	1466.
150	4.41	33.51	149	26.58	147.7	3.16	2.29	1469.
175	4.39	33.73	174	26.77	130.8	3.50	2.85	1470.
200	4.30	33.77	199	26.80	127.4	3.82	3.47	1470.
225	4.22	33.81	223	26.84	123.8	4.14	4.15	1470.
250	4.11	33.84	248	26.88	120.8	4.44	4.89	1470.
300	3.96	33.89	298	26.93	115.8	5.03	6.55	1470.
400	3.90	34.03	397	27.05	105.5	6.14	10.49	1472.



OFFSHORE OCEANOGRAPHY GROUP

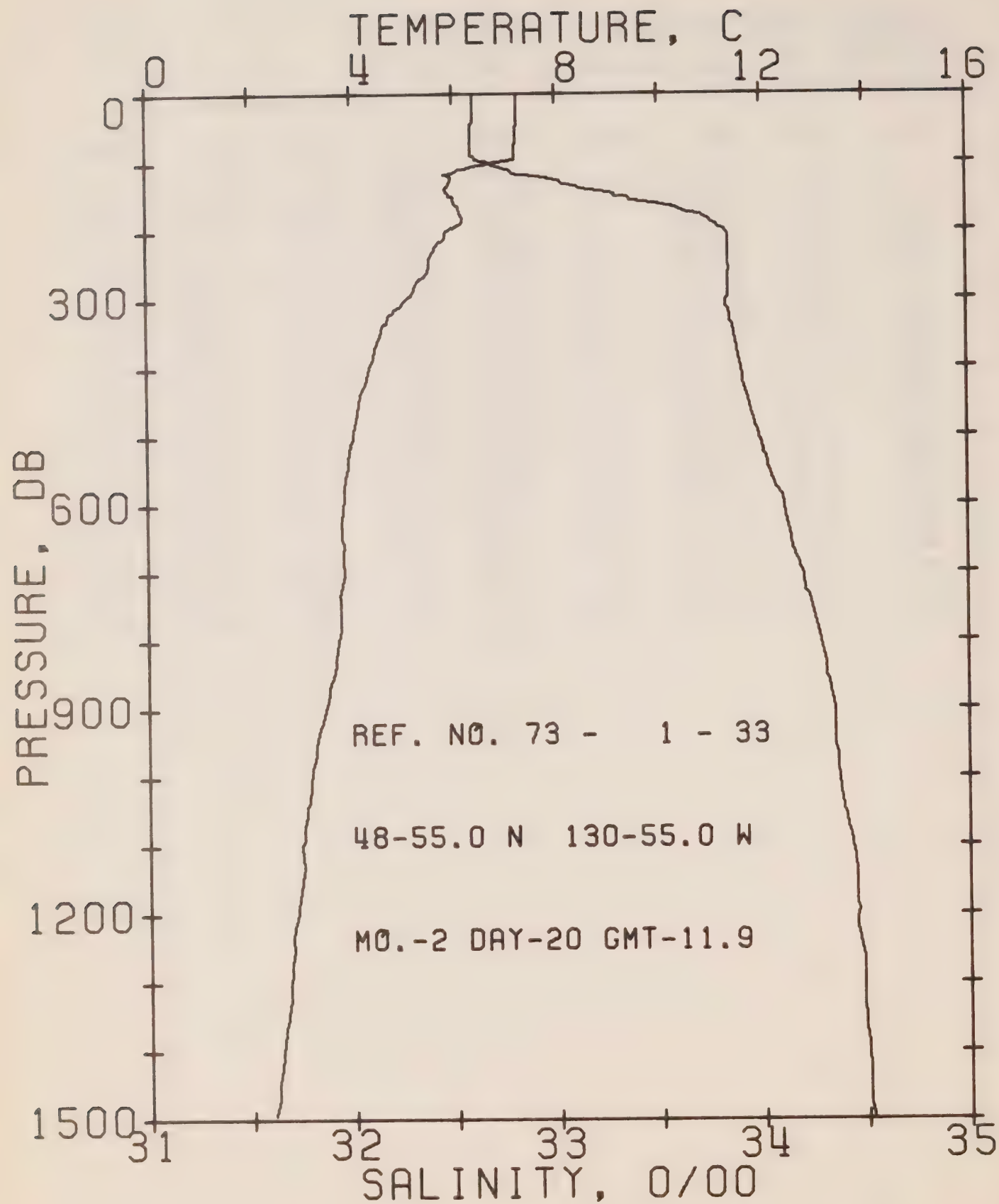
REFERENCE NO. 73- 1- 32

DATE 19/ 2/73

POSITION 49-55.0N, 143-46.0W GMT 1.6

RESULTS OF STP CAST 137 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.74	32.59	0	25.71	229.5	0.0	0.0	1471.
10	5.72	32.59	10	25.71	229.5	0.23	0.01	1471.
20	5.70	32.59	20	25.71	229.5	0.46	0.05	1471.
30	5.69	32.59	30	25.71	229.4	0.69	0.11	1471.
50	5.68	32.59	50	25.72	229.3	1.15	0.29	1471.
75	5.67	32.60	75	25.72	229.1	1.72	0.66	1472.
100	5.61	32.60	99	25.73	228.6	2.29	1.17	1472.
125	4.59	32.98	124	26.15	188.7	2.82	1.77	1469.
150	4.80	33.52	149	26.55	151.1	3.24	2.36	1471.
175	4.92	33.68	174	26.66	140.9	3.61	2.96	1472.
200	4.61	33.75	199	26.75	132.3	3.95	3.61	1471.
225	4.41	33.80	223	26.81	126.6	4.27	4.31	1471.
250	4.26	33.83	248	26.86	122.7	4.58	5.07	1470.
300	4.12	33.89	298	26.92	117.5	5.18	6.75	1471.
400	3.90	34.00	397	27.03	107.7	6.31	10.77	1472.
500	3.71	34.10	496	27.12	99.4	7.35	15.52	1473.
600	3.53	34.17	595	27.20	92.5	8.31	20.89	1474.
800	3.19	34.30	793	27.33	81.1	10.04	33.18	1476.
1000	2.85	34.39	990	27.43	71.9	11.57	47.21	1478.
1200	2.51	34.45	1188	27.51	65.8	12.94	62.52	1480.



OFFSHORE OCEANOGRAPHY GROUP

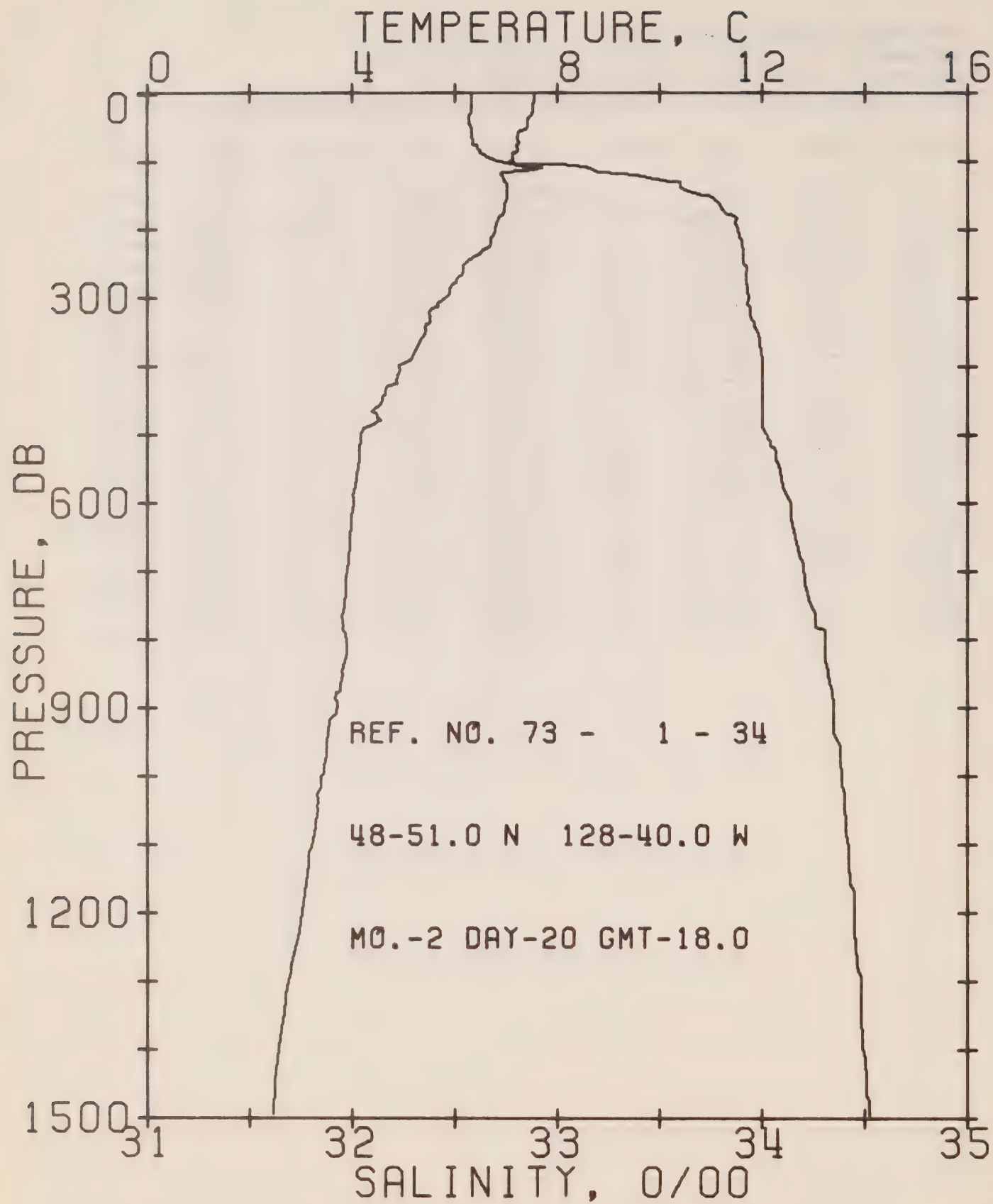
REFERENCE NO. 73- 1- 33

DATE 20/ 2/73

POSITION 48-55.0N, 130-55.0W GMT 11.9

RESULTS OF STP CAST 197 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.25	32.60	0	25.52	247.2	0.0	0.0	1477.
10	7.25	32.60	10	25.52	247.5	0.25	0.01	1477.
20	7.25	32.60	20	25.52	247.7	0.49	0.05	1477.
30	7.26	32.60	30	25.52	247.9	0.74	0.11	1477.
50	7.23	32.59	50	25.52	248.5	1.24	0.32	1478.
75	7.21	32.59	75	25.52	248.5	1.86	0.71	1478.
100	6.83	32.69	99	25.65	236.5	2.48	1.26	1477.
125	5.96	32.99	124	26.00	203.8	3.03	1.90	1474.
150	5.93	33.29	149	26.24	181.2	3.51	2.57	1475.
175	6.16	33.69	174	26.52	154.5	3.93	3.26	1477.
200	5.90	33.43	199	26.67	141.2	4.30	3.97	1476.
225	5.64	33.84	223	26.71	137.6	4.65	4.72	1476.
250	5.51	33.84	248	26.72	136.2	4.99	5.55	1476.
300	5.07	33.84	293	26.77	132.0	5.66	7.43	1475.
400	4.35	33.90	397	26.90	120.2	6.92	11.89	1473.
500	4.03	33.99	496	27.00	110.9	8.07	17.18	1474.
600	3.82	34.11	595	27.12	100.4	9.13	23.10	1475.
800	3.71	34.28	793	27.27	88.1	11.03	36.58	1478.
1000	3.15	34.37	991	27.39	76.9	12.66	51.53	1479.
1200	2.38	34.46	1188	27.49	68.4	14.09	67.61	1481.



OFFSHORE OCEANOGRAPHY GROUP

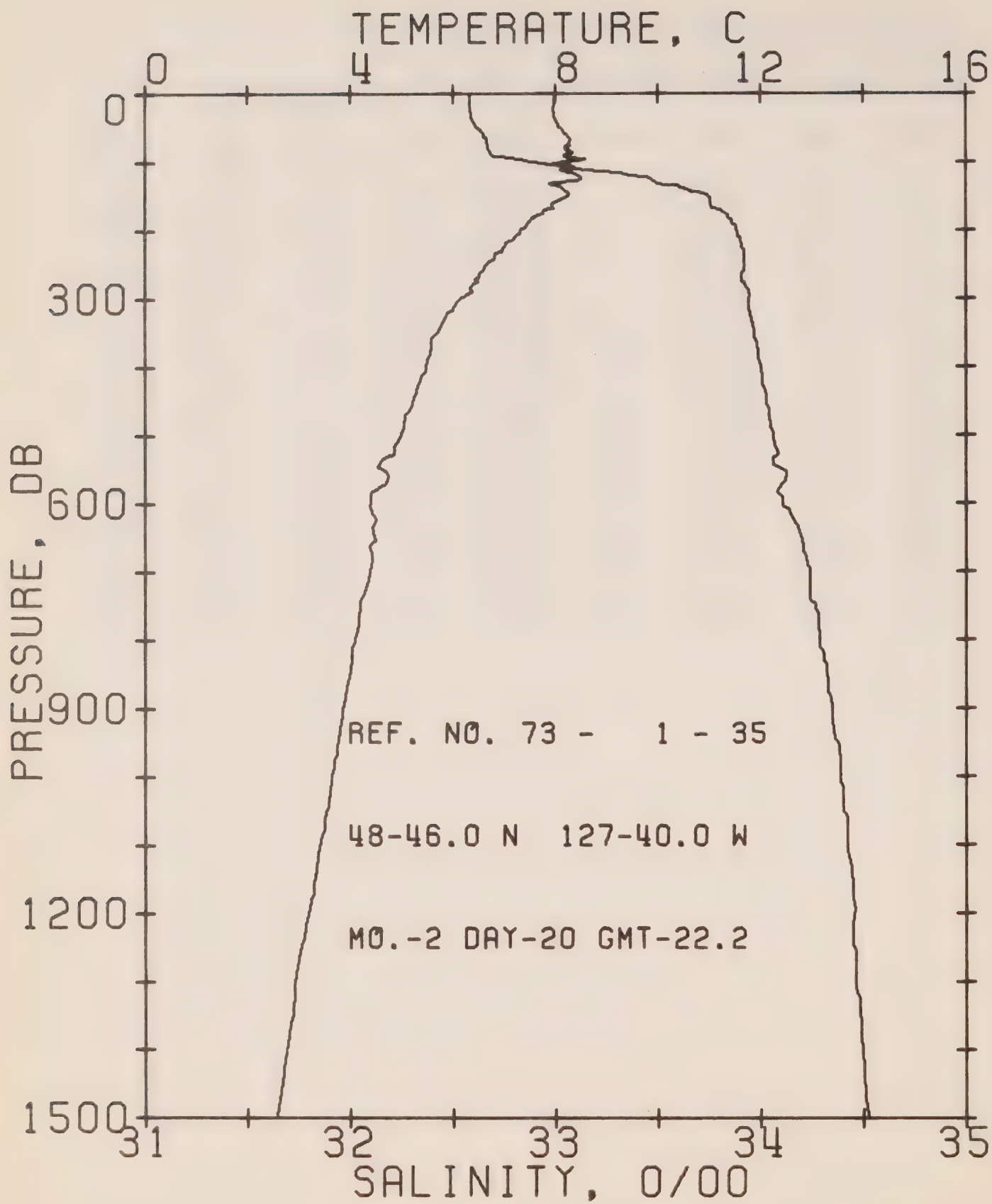
REFERENCE NO. 73- 1- 34

DATE 20/ 2/73

POSITION 48-51.0N, 128-40.0W GMT 18.0

RESULTS OF STP CAST 223 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.54	32.58	0	25.47	252.4	0.0	0.0	1478.
10	7.54	32.58	10	25.47	252.8	0.25	0.01	1478.
20	7.52	32.58	20	25.47	252.7	0.51	0.05	1478.
30	7.51	32.58	30	25.47	252.7	0.76	0.12	1478.
50	7.40	32.57	50	25.48	251.9	1.26	0.32	1478.
75	7.22	32.59	75	25.52	248.7	1.89	0.72	1478.
100	7.09	32.71	99	25.63	238.4	2.50	1.27	1478.
125	6.93	33.45	124	26.24	181.3	3.02	1.86	1479.
150	7.01	33.71	149	26.43	163.6	3.45	2.46	1480.
175	6.94	33.82	174	26.52	155.0	3.84	3.11	1480.
200	6.78	33.88	199	26.59	148.6	4.22	3.83	1480.
225	6.67	33.90	223	26.62	146.0	4.58	4.02	1480.
250	6.21	33.91	248	26.69	139.6	4.94	5.49	1479.
300	5.81	33.94	298	26.76	133.1	5.62	7.40	1478.
400	4.91	34.00	397	26.92	119.0	6.89	11.90	1476.
500	4.16	34.02	496	27.01	110.0	8.04	17.20	1474.
600	4.02	34.14	595	27.12	100.6	9.09	23.07	1476.
800	3.90	34.31	793	27.27	87.9	10.99	36.59	1479.
1000	3.41	34.39	991	27.39	77.9	12.66	51.84	1480.
1200	3.00	34.45	1188	27.47	70.2	14.15	68.48	1492.



OFFSHORE OCEANOGRAPHY GROUP

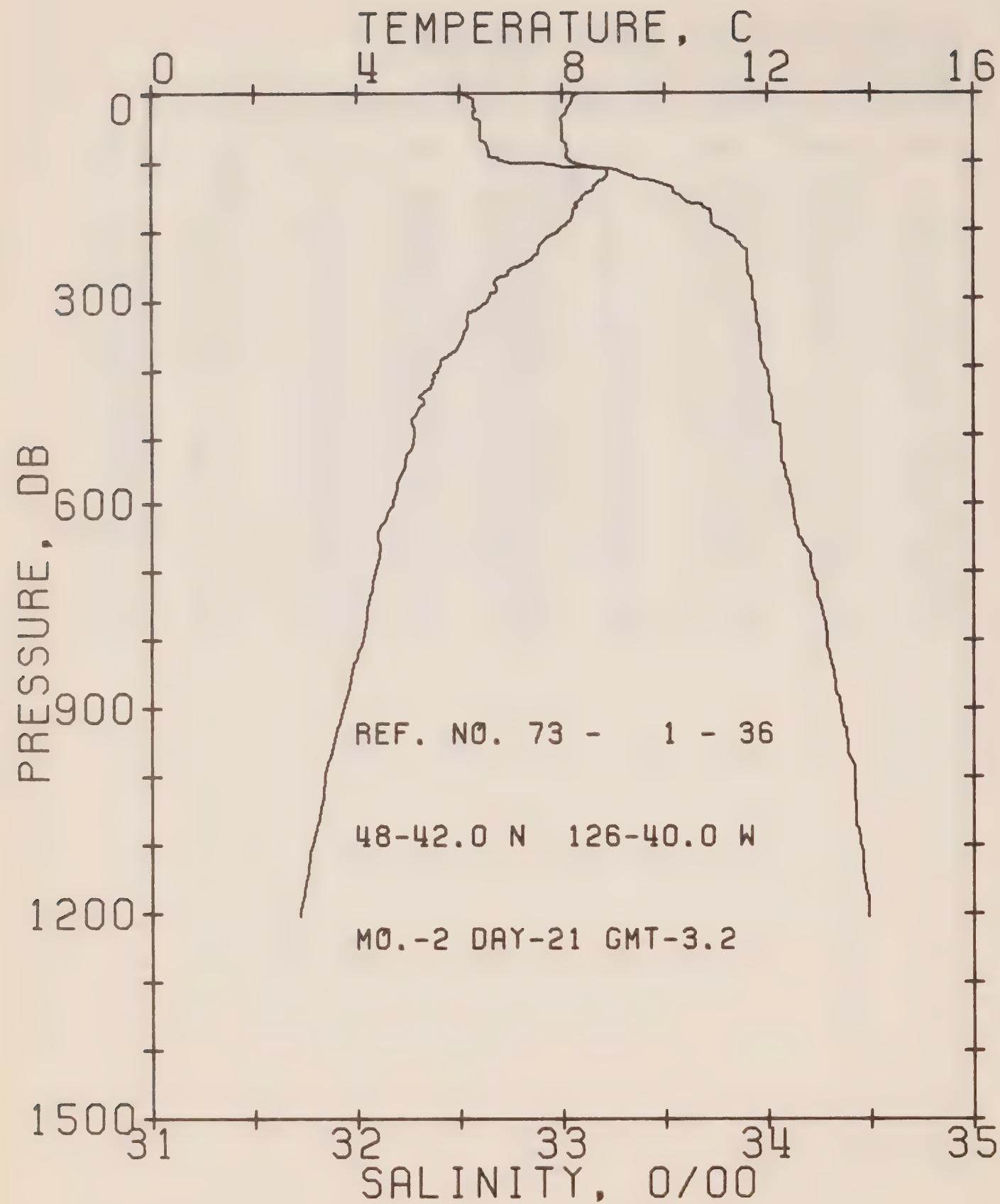
REFERENCE NO. 73- 1- 35

DATE 20/ 2/73

POSITION 48-46.0N, 127-40.0W GMT 22.2

RESULTS OF STP CAST 241 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.00	32.58	0	25.40	258.7	0.0	0.0	1480.
10	7.98	32.58	10	25.40	258.8	0.26	0.01	1480.
20	7.97	32.58	20	25.40	258.7	0.52	0.05	1480.
30	7.97	32.59	30	25.41	258.4	0.78	0.12	1480.
50	8.07	32.51	50	25.42	258.0	1.29	0.33	1481.
75	8.25	32.57	75	25.43	256.8	1.94	0.74	1482.
100	8.16	32.39	99	25.62	239.6	2.57	1.31	1482.
125	8.50	33.46	124	26.02	202.4	3.12	1.93	1485.
150	8.24	33.74	149	26.27	178.5	3.59	2.59	1485.
175	7.75	33.83	174	26.42	165.2	4.02	3.30	1483.
200	7.34	33.88	199	26.51	156.2	4.42	4.07	1482.
225	6.98	33.91	223	26.59	149.4	4.80	4.70	1481.
250	6.64	33.92	248	26.64	144.5	5.17	5.78	1480.
300	6.16	33.94	298	26.72	137.1	5.88	7.77	1479.
400	5.46	34.00	397	26.85	125.6	7.19	12.42	1478.
500	4.98	34.06	496	26.96	116.3	8.39	17.95	1478.
600	4.38	34.11	595	27.06	106.6	9.50	24.17	1477.
800	4.08	34.29	793	27.24	91.6	11.47	38.16	1479.
1000	3.64	34.39	991	27.36	80.6	13.19	53.85	1481.
1200	3.17	34.46	1188	27.46	71.7	14.71	70.90	1482.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 1- 36

DATE 21/ 2/73

POSITION 48-42.0N. 126-40.0W GMT 3.2

RESULTS OF STP CAST 221 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.31	32.51	0	25.30	268.2	0.0	0.0	1481.
10	8.18	32.57	10	25.37	262.2	0.26	0.01	1481.
20	8.11	32.57	20	25.38	261.5	0.53	0.05	1481.
30	8.06	32.57	30	25.38	260.9	0.79	0.12	1480.
50	8.00	32.60	50	25.42	258.1	1.31	0.33	1481.
75	8.09	32.63	75	25.43	257.5	1.95	0.74	1481.
100	8.16	32.72	99	25.49	252.2	2.59	1.31	1482.
125	8.83	33.39	124	25.91	212.7	3.16	1.96	1486.
150	8.41	33.57	149	26.12	193.4	3.66	2.67	1485.
175	8.22	33.72	174	26.26	180.1	4.13	3.44	1485.
200	7.94	33.78	199	26.35	172.0	4.57	4.29	1484.
225	7.54	33.88	223	26.49	159.4	4.99	5.18	1483.
250	7.24	33.90	248	26.54	154.1	5.38	6.13	1483.
300	6.55	33.93	298	26.66	143.2	6.11	8.18	1491.
400	5.60	33.98	397	26.82	128.4	7.47	13.01	1479.
500	5.13	34.06	496	26.94	118.2	8.69	18.61	1478.
600	4.70	34.12	595	27.04	109.6	9.83	24.99	1478.
800	4.11	34.29	793	27.23	91.9	11.82	39.14	1479.
1000	3.35	34.42	991	27.41	75.0	13.49	54.40	1480.
1200	2.37	34.49	1188	27.51	65.8	14.91	70.27	1481.

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 1- 37

DATE 21/ 2/73

POSITION 48-38.0N, 126- 0.0W GMT 6.2

RESULTS OF STP CAST 54 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.19	29.99	0	23.35	454.4	0.0	0.0	1477.
10	8.22	30.03	10	23.37	452.1	0.45	0.02	1477.
20	8.34	30.15	20	23.45	444.9	0.90	0.09	1478.
30	8.37	30.32	30	23.58	432.7	1.34	0.20	1479.
50	8.23	30.53	50	23.76	415.4	2.19	0.55	1479.
75	8.20	30.65	75	23.86	406.4	3.21	1.20	1479.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	8.19	29.99	49.	8.23	30.52
4.	8.19	30.00	52.	8.23	30.55
8.	8.21	30.01	53.	8.23	30.57
10.	8.22	30.03	56.	8.23	30.58
12.	8.24	30.04	58.	8.21	30.58
13.	8.26	30.06	59.	8.20	30.59
15.	8.28	30.06	61.	8.15	30.59
16.	8.34	30.07	66.	8.16	30.59
17.	8.37	30.08	70.	8.16	30.61
18.	8.37	30.11	71.	8.18	30.61
20.	8.34	30.15	72.	8.19	30.62
21.	8.34	30.17	76.	8.20	30.66
22.	8.34	30.20	79.	8.24	30.70
23.	8.36	30.22	80.	8.28	30.72
24.	8.37	30.27	81.	8.29	30.77
28.	8.37	30.29	84.	8.32	30.78
30.	8.37	30.32	85.	8.35	30.78
34.	8.37	30.34	86.	8.36	30.83
36.	8.32	30.39	87.	8.37	30.83
38.	8.31	30.42	88.	8.38	30.86
40.	8.29	30.44	91.	8.42	30.87
40.	8.28	30.44	92.	8.43	30.89
41.	8.28	30.47	93.	8.45	30.89
44.	8.26	30.48	94.	8.52	30.91
45.	8.26	30.50	94.	8.52	31.04
46.	8.26	30.50	95.	8.53	31.07
48.	8.26	30.51	97.	8.55	31.07

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 1- 38

DATE 21/ 2/73

POSITION 48-33.0N, 125-33.0W GMT 8.2

RESULTS OF STP CAST 40 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.35	32.19	0	25.04	292.6	0.0	0.0	1481.
10	8.33	32.22	10	25.07	290.6	0.29	0.01	1481.
20	8.40	32.35	20	25.16	281.9	0.58	0.06	1481.
30	8.47	32.48	30	25.25	273.4	0.86	0.13	1482.
50	8.42	32.60	50	25.36	263.8	1.39	0.35	1482.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	8.35	32.19	34.	8.25	32.51
2.	8.32	32.20	41.	8.26	32.52
2.	8.32	32.20	41.	8.26	32.53
5.	8.32	32.21	43.	8.28	32.55
12.	8.33	32.22	45.	8.31	32.55
13.	8.34	32.23	47.	8.32	32.55
16.	8.35	32.25	48.	8.36	32.60
16.	8.35	32.26	49.	8.41	32.60
19.	8.38	32.30	53.	8.47	32.62
20.	8.40	32.35	57.	8.53	32.64
21.	8.38	32.37	59.	8.64	32.66
22.	8.36	32.37	60.	8.64	32.67
22.	8.35	32.37	61.	8.60	32.68
23.	8.43	32.44	61.	8.64	32.68
25.	8.46	32.46	62.	8.65	32.69
25.	8.46	32.46	63.	8.67	32.69
28.	8.46	32.48	64.	8.73	32.71
30.	8.47	32.48	66.	8.77	32.73
30.	8.45	32.49	67.	8.79	32.74
33.	8.25	32.50	68.	8.84	32.76

SURFACE TEMPERATURE AND SALINITY OBSERVATIONS

(P-73-1)

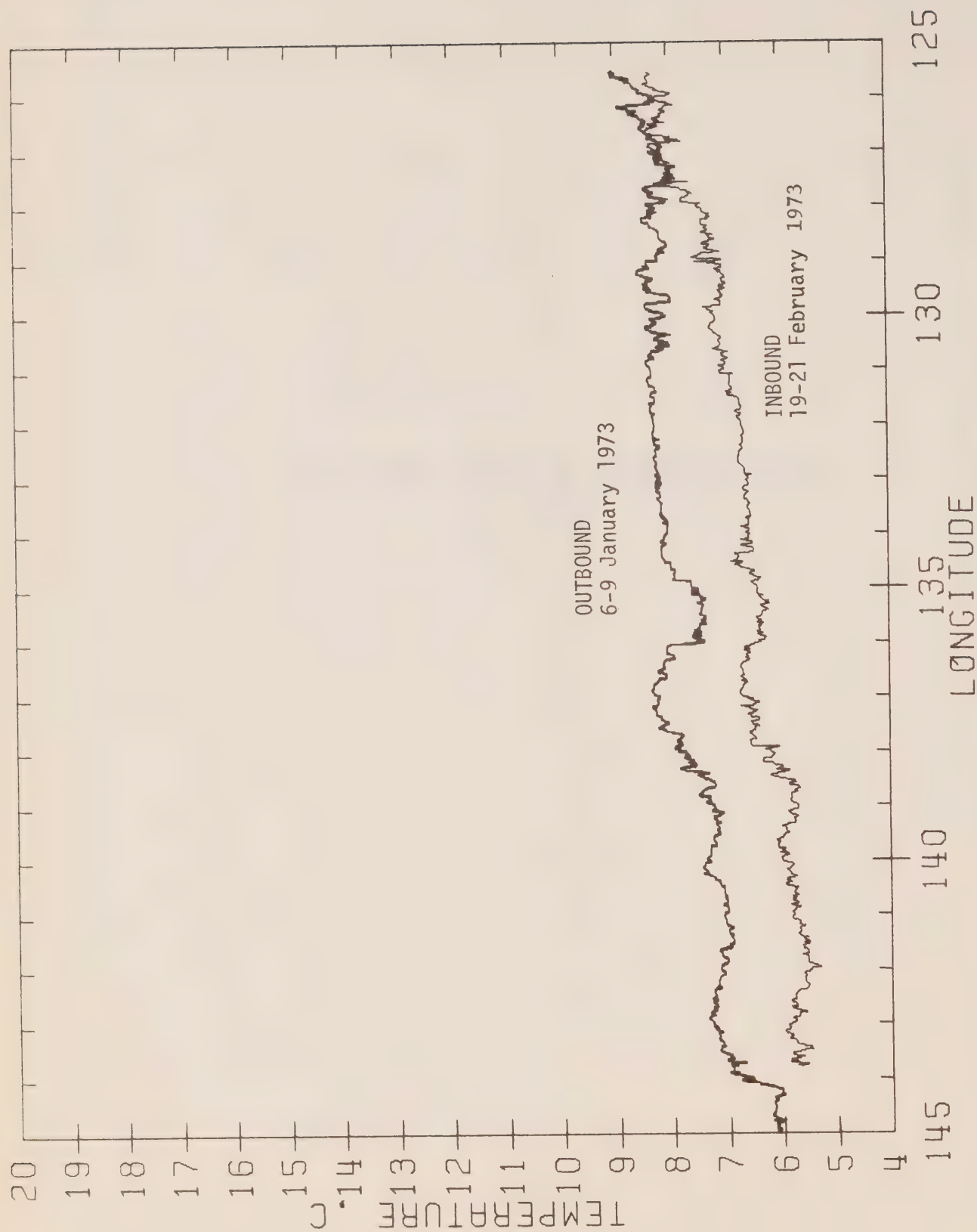


Figure 7 Surface temperature along Line P recorded from engine room intake. P-73-1

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 1

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GAT	0/00	C	WEST
73	1	6	15	32.514	9.1	125-33
73	1	6	200	32.013	8.4	126- 0
73	1	6	430	32.475	8.4	126-40
73	1	6	800	32.419	8.3	127-40
73	1	6	1200	32.457	8.1	128-40
73	1	6	15	32.510	9.1	125-33
73	1	6	200	32.056	8.4	126- 0
73	1	6	430	32.474	8.4	126-40
73	1	6	800	32.417	8.3	127-40
73	1	6	1200	32.463	8.1	128-40
73	1	6	1545	32.446	7.9	129-40
73	1	6	1900	32.557	8.3	130-40
73	1	6	2210	32.535	8.3	131-40
73	1	7	100	32.581	8.2	132-40
73	1	7	420	32.589	8.1	133-40
73	1	7	710	32.481	8.0	134-40
73	1	7	1005	32.265	7.4	135-40
73	1	7	1220	32.380	8.2	136-40
73	1	7	1545	32.553	8.1	137-40
73	1	7	1810	32.539	7.3	138-40
73	1	7	2120	32.546	7.2	139-40
73	1	7	2350	32.537	7.1	140-40
73	1	8	340	32.560	7.2	141-40
73	1	8	630	32.555	7.2	142-40
73	1	8	1030	32.564	7.0	143-40
73	1	9	0	32.609	6.1	ON STATION
73	1	10	0	32.606	6.1	ON STATION
73	1	11	0	32.613	6.2	ON STATION
73	1	12	0	32.607	6.2	ON STATION
73	1	13	0	32.609	6.1	ON STATION
73	1	14	0	32.607	6.1	ON STATION
73	1	15	0	32.605	6.1	ON STATION
73	1	16	0	32.606	6.1	ON STATION
73	1	17	0	32.607	6.1	ON STATION
73	1	18	0	32.606	6.1	ON STATION
73	1	19	0	32.612	6.0	ON STATION
73	1	20	0	32.603	6.0	ON STATION
73	1	21	0	32.603	6.2	ON STATION
73	1	22	0	32.601	5.8	ON STATION
73	1	23	0	32.610	5.8	ON STATION
73	1	24	0	32.599	5.9	ON STATION
73	1	25	0	32.609	5.8	ON STATION
73	1	26	0	32.607	5.8	ON STATION
73	1	27	0	32.608	5.6	ON STATION
73	2	2	0	32.609	5.6	ON STATION

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 1

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GMT	0/00	C	WEST
73	2	2	0	32.609	5.6	ON STATION
73	2	3	0	32.607	5.3	ON STATION
73	2	4	0	32.614	5.7	ON STATION
73	2	5	0	32.617	5.4	ON STATION
73	2	6	0	32.610	5.4	ON STATION
73	2	7	0	32.603	5.4	ON STATION
73	2	8	0	32.610	5.5	ON STATION
73	2	9	0	32.607	5.5	ON STATION
73	2	10	0	32.611	5.6	ON STATION
73	2	11	0	32.608	5.4	ON STATION
73	2	12	0	32.605	5.4	ON STATION
73	2	13	0	32.623	5.4	ON STATION
73	2	14	0	32.610	5.6	ON STATION
73	2	15	0	32.608	5.5	ON STATION
73	2	16	0	32.614	5.5	ON STATION
73	2	17	0	32.600	5.6	ON STATION
73	2	18	0	32.583	5.4	ON STATION
73	2	19	0		5.8	ON STATION
73	2	19	230	32.596		143-46
73	2	19	345	32.587	6.0	143-40
73	2	19	320	32.587	6.1	142-40
73	2	19	1325	32.588	6.1	140-40
73	2	19	1535	32.583	6.3	139-40
73	2	19	1800	32.584	6.0	138-40
73	2	19	2025	32.602	6.8	137-40
73	2	19	2255	32.586	7.1	136-40
73	2	20	130	32.497	6.6	135-40
73	2	20	335	32.507	6.9	134-40
73	2	20	545	32.509	6.9	133-40
73	2	20	800	32.547	7.1	132-40
73	2	20	940	32.570	7.1	131-40
73	2	20	1150	32.593	7.3	130-55
73	2	20	1450	32.576	7.3	129-40
73	2	20	1300	32.584	7.6	128-40
73	2	20	2210	32.583	8.1	127-40
73	2	21	310	32.480	8.3	126-40
73	2	21	610	31.518	8.2	126- 0
73	2	21	810	32.203	8.3	125-33
73	2	20	2210	32.590	8.1	127-40
73	2	21	310	32.504	8.3	126-40
73	2	21	610	31.414	8.2	126- 0
73	2	21	810	32.218	8.3	125-33

OCEANOGRAPHIC DATA OBTAINED ON CRUISE P-73-2
(CODC REFERENCE No. 15-73-002)

SURFACE TEMPERATURE OBSERVATIONS

(P-73-2)

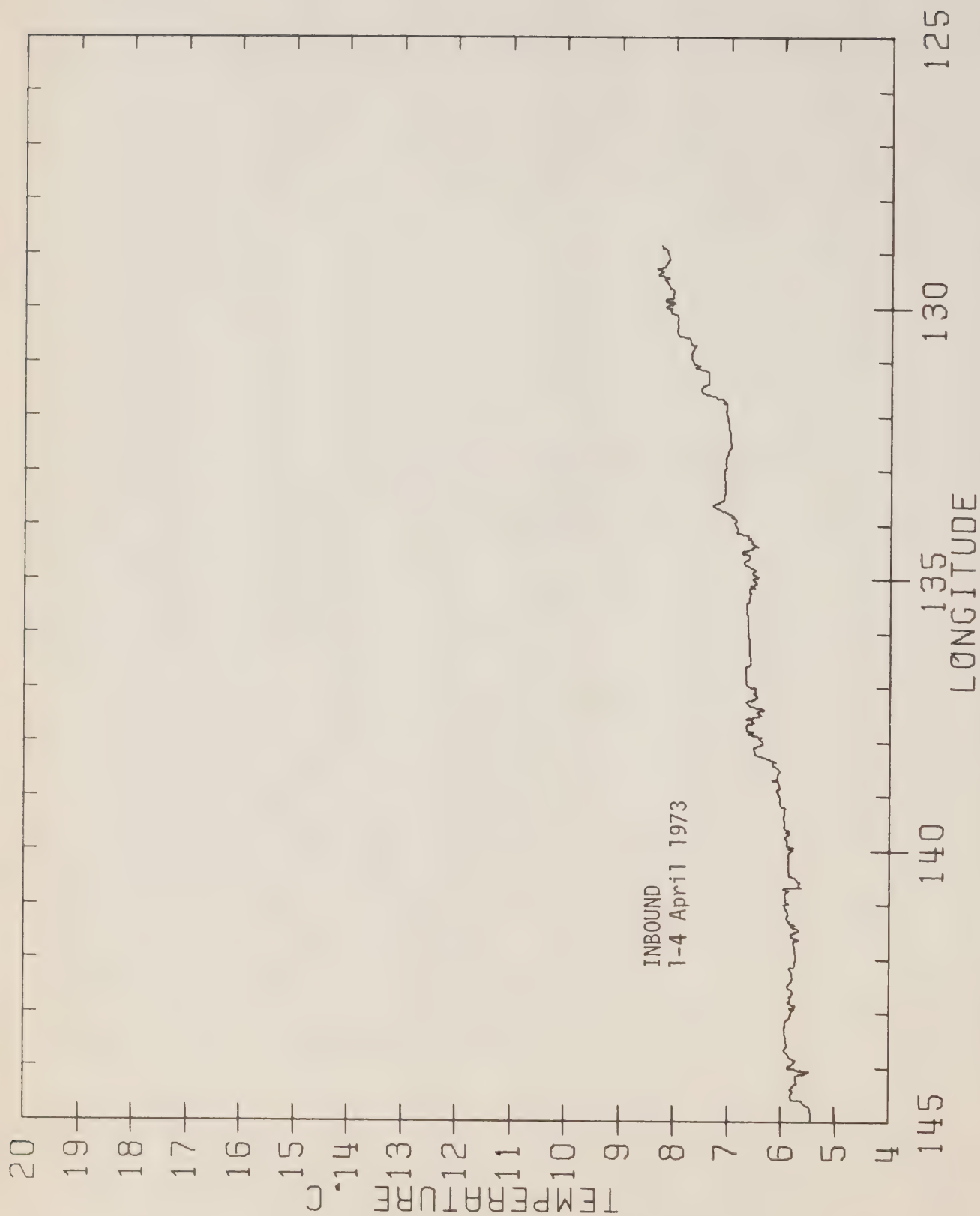


Figure 8 Surface temperature along Line P recorded from engine room intake. P-73-2

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 2

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GMT	0/00	C	WEST
73	2	17	700	32.577	7.8	127-40
73	2	17	1100	32.589	7.6	128-40
73	2	17	1430	32.562	8.0	129-40
73	2	17	1830	32.620	8.3	130-40
73	2	17	2215	32.604	7.9	131-40
73	2	18	130	32.665	7.9	132-40
73	2	18	630	32.662	7.3	133-40
73	2	18	830	32.627	7.3	134-40
73	2	18	1140	32.625	7.3	135-40
73	2	18	1445	32.567	6.8	136-40
73	2	18	1800	32.579	6.9	137-40
73	2	18	2200	32.579	6.5	138-40
73	2	19	106	32.593	6.3	139-40
73	2	19	435	32.603	6.3	140-40
73	2	19	750	32.596	5.8	141-40
73	2	19	1130	32.603	5.7	142-40
73	2	20	0	32.650		ON STATION
73	2	21	0	32.595	5.3	ON STATION
73	2	25	0	32.584	5.4	ON STATION
73	2	26	0	32.590	5.3	ON STATION
73	2	27	0	32.594	5.4	ON STATION
73	2	28	0	32.594	5.3	ON STATION
73	3	1	0	32.600	5.3	ON STATION
73	3	2	0	32.610	5.2	ON STATION
73	3	3	0	32.663	5.1	ON STATION
73	3	4	0	32.621	5.4	ON STATION
73	3	5	0	32.631	5.3	ON STATION
73	3	6	0	32.594	5.4	ON STATION
73	3	7	0	32.587	5.3	ON STATION
73	3	8	0	32.591	5.4	ON STATION
73	3	9	0	32.578	5.4	ON STATION
73	3	10	0	32.619		ON STATION
73	3	11	0	32.619	5.3	ON STATION
73	3	12	0	32.621	5.6	ON STATION
73	3	13	0	32.605		ON STATION
73	3	14	0	32.610		ON STATION
73	3	15	0	32.658	5.7	ON STATION
73	3	16	0	32.645		ON STATION
73	3	17	0	32.610		ON STATION
73	3	18	0	32.623	5.3	ON STATION
73	3	19	0	32.624		ON STATION
73	3	20	0	32.664	5.0	ON STATION
73	3	21	0	32.634		ON STATION
73	3	22	0	32.660	5.3	ON STATION
73	3	23	0	32.648		ON STATION

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 2

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GMT	0/00	C	WEST
73	3	23	0	32.648		ON STATION
73	3	24	0	32.635	5.5	ON STATION
73	3	25	0	32.637	5.4	ON STATION
73	3	26	0	32.623	5.2	ON STATION
73	3	27	0	32.653	5.4	ON STATION
73	3	28	0	32.639	5.5	ON STATION
73	3	29	0	32.650		ON STATION
73	3	30	0	32.630	5.5	ON STATION
73	3	31	0	32.641	5.5	ON STATION
73	4	1	0	32.629	5.6	145- 0
73	4	2	0	32.625	5.7	143-57
73	4	2	150	32.599	5.7	143-40
73	4	2	740		5.9	142-40
73	4	2	1040	32.585	5.9	141-40
73	4	2	1500	32.593	6.4	140-40
73	4	0	0	32.627		138-40
73	4	0	0	32.603		137-40
73	4	0	0	32.570		136-42
73	4	0	0	32.525		135-40
73	4	3	730	32.482		134-40
73	4	0	0	32.559		133-40
73	4	0	0	32.482		132-40
73	4	3	1800	32.507	7.3	131-40
73	4	3	2120	32.584	7.8	130-40
73	4	4	20	32.456	8.5	129-49
73	4	4	330	31.759	8.2	128-50
73	4	4	0	31.557		127-40
73	4	4	840	31.987		126-40
73	4	4	1125	31.965		126- 0
73	4	4	0	31.302		125-34

OCEANOGRAPHIC DATA OBTAINED ON CRUISE P-73-3

(CODC REFERENCE No. 15-73-003)

RESULTS OF BOTTLE CASTS

(P-73-3)

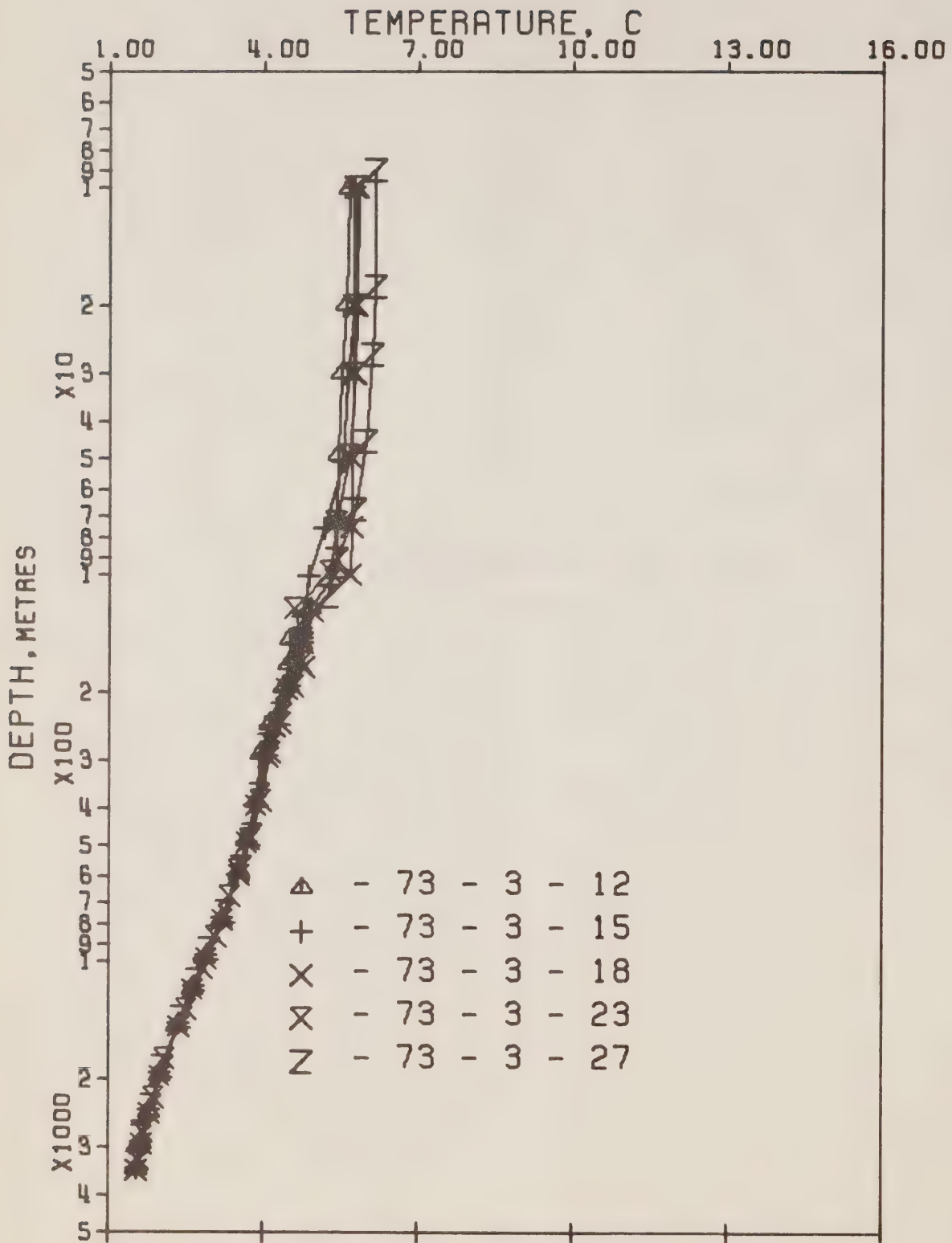


Figure 9

Composite plot of temperature vs \log_{10} depth. P-73-3

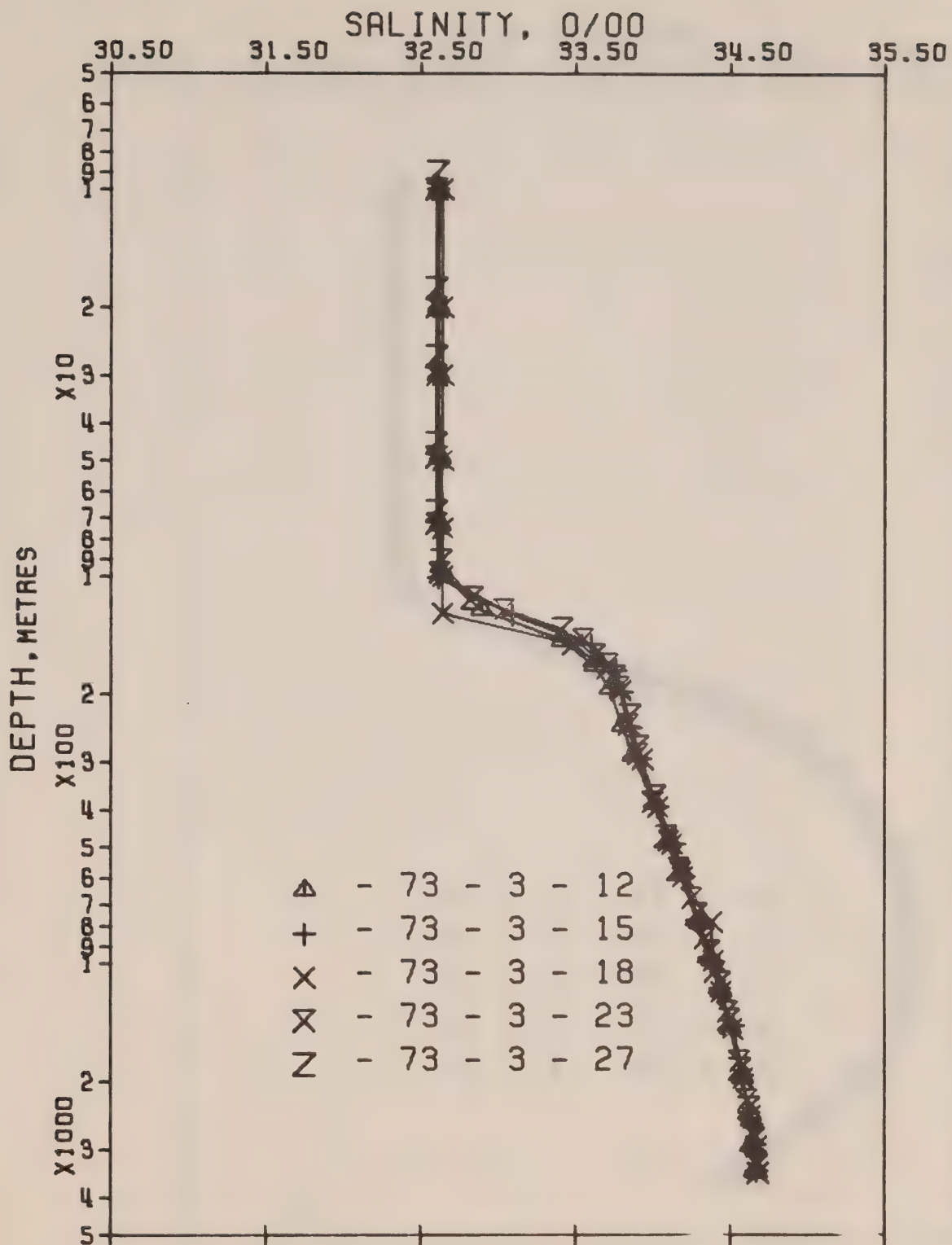


Figure 10

Composite plot of salinity vs \log_{10} depth. P-73-3

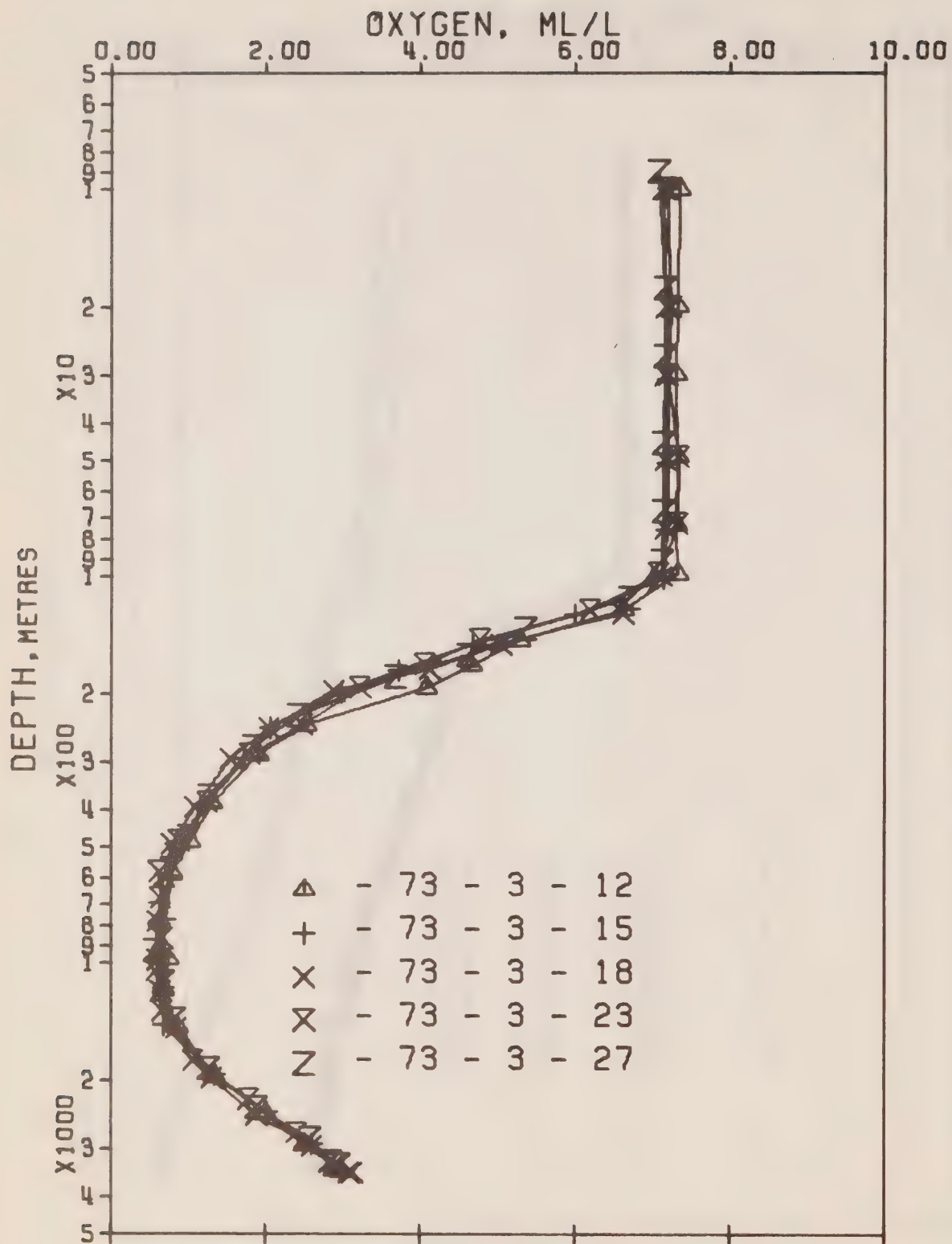
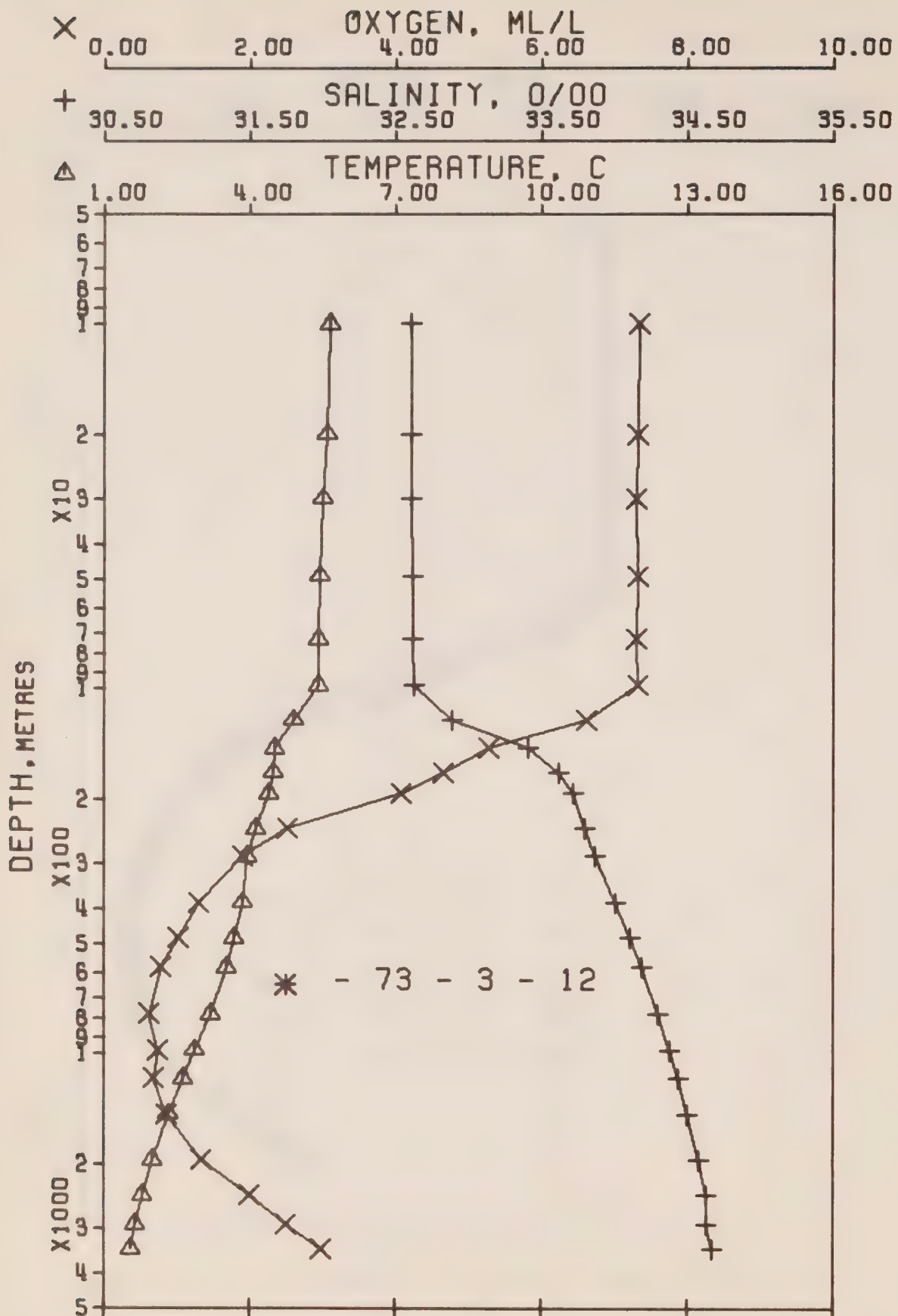


Figure 11 Composite plot of oxygen vs \log_{10} depth. P-73-3



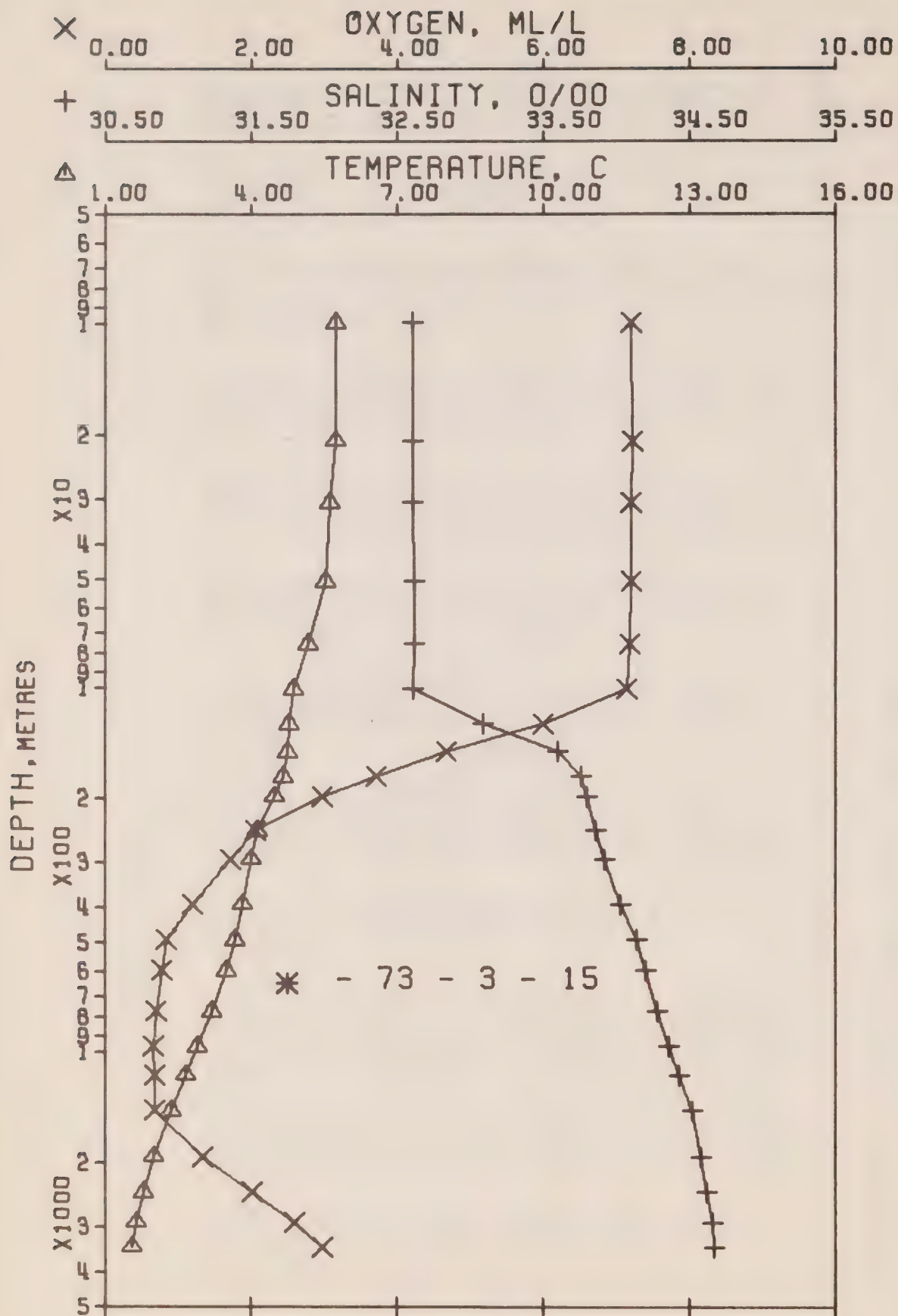
OFFSHORE OCEANOGRAPHY GROUP
 POSITION 49-59.0 N. 145- 2.0 W GMT 19.0
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 3- 12

DATE

4/ 4/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	5.65	32.611	0	25.734	227.1	5.65	226.9	0.0	0.0	6.91	1470.
10	5.66	32.607	10	25.730	227.6	5.66	227.3	0.23	0.01	7.35	1471.
20	5.59	32.608	20	25.739	226.8	5.59	226.4	0.46	0.05	7.31	1471.
30	5.50	32.614	30	25.754	225.5	5.50	225.0	0.69	0.11	7.30	1470.
49	5.43	32.622	49	25.769	224.3	5.43	223.6	1.11	0.28	7.31	1470.
73	5.42	32.625	73	25.772	224.2	5.41	223.2	1.66	0.62	7.30	1471.
99	5.41	32.630	99	25.777	224.0	5.40	222.7	2.22	1.12	7.31	1471.
123	4.90	32.896	122	26.037	199.4	4.89	198.0	2.74	1.70	6.63	1470.
147	4.52	33.413	146	26.496	156.1	4.51	154.4	3.17	2.29	5.28	1469.
171	4.48	33.621	170	26.665	140.2	4.47	138.4	3.52	2.86	4.66	1470.
195	4.40	33.720	194	26.752	132.2	4.39	130.1	3.85	3.48	4.08	1470.
244	4.12	33.902	242	26.347	123.6	4.10	121.1	4.47	4.85	2.53	1470.
291	3.93	33.875	289	26.924	115.6	3.91	113.8	5.04	6.40	1.91	1470.
388	3.85	34.014	385	27.042	106.0	3.82	102.5	6.11	10.12	1.31	1471.
485	3.68	34.114	482	27.139	97.6	3.65	93.3	7.10	14.55	1.02	1472.
586	3.51	34.195	581	27.220	90.5	3.47	85.5	8.04	19.68	0.78	1473.
785	3.18	34.297	778	27.332	80.8	3.13	74.7	9.74	31.55	0.62	1475.
994	2.87	34.390	975	27.427	72.6	2.80	65.7	11.26	45.30	0.74	1477.
1193	2.61	34.437	1171	27.495	66.8	2.53	59.2	12.64	60.53	0.68	1480.
1431	2.33	34.501	1465	27.570	60.4	2.23	52.0	14.53	86.16	0.85	1483.
1930	1.99	34.579	1956	27.660	52.9	1.85	43.2	17.33	135.60	1.34	1490.
2430	1.77	34.626	2447	27.714	48.6	1.59	37.8	19.85	192.73	2.00	1498.
2933	1.64	34.628	2949	27.726	48.3	1.42	36.4	22.28	260.59	2.50	1506.
3431	1.55	34.658	3437	27.764	45.6	1.28	32.5	24.67	339.45	2.99	1514.

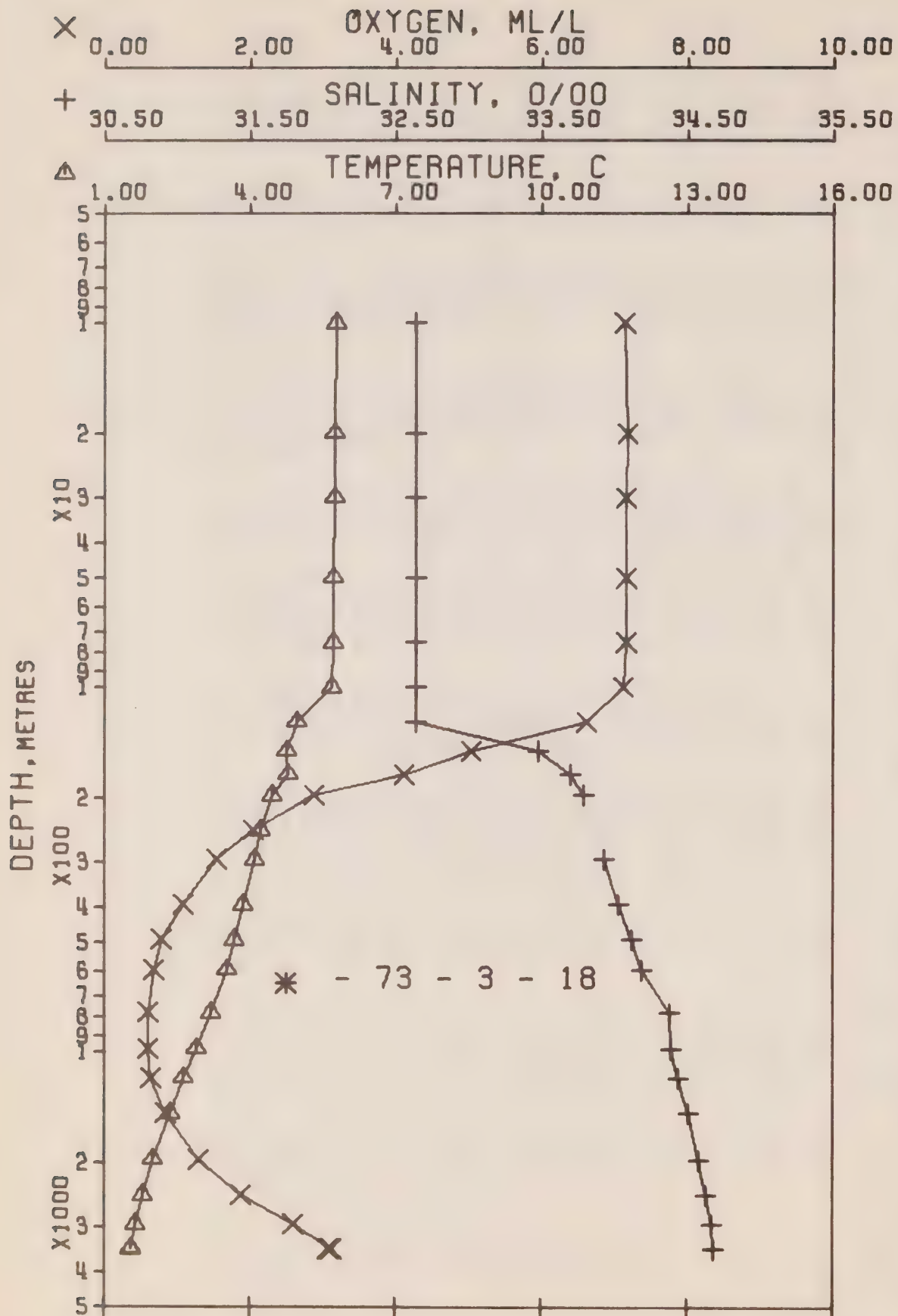


OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50-2.0 N, 144-55.0 W GMT 21.1
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 3- 15

DATE 9/ 4/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
9	5.75	32.640	0	25.745	226.1	5.75	225.9	0.0	0.0	7.08	1471.
10	5.75	32.607	10	25.719	228.6	5.75	228.3	0.23	0.01	7.21	1471.
21	5.73	32.608	21	25.722	228.5	5.73	227.9	0.48	0.05	7.23	1471.
31	5.63	32.608	31	25.734	227.4	5.63	226.9	0.71	0.11	7.21	1471.
51	5.52	32.623	51	25.759	225.2	5.52	224.5	1.17	0.30	7.20	1471.
70	5.16	32.625	70	25.802	221.3	5.15	220.4	1.73	0.67	7.18	1470.
102	4.86	32.615	101	25.827	219.2	4.85	218.0	2.29	1.18	7.15	1469.
127	4.78	33.094	126	26.215	182.6	4.77	181.1	2.80	1.77	5.99	1470.
151	4.75	33.597	150	26.617	144.8	4.74	143.0	3.19	2.33	4.69	1471.
176	4.67	33.759	175	26.754	132.0	4.66	130.0	3.54	2.90	3.72	1471.
200	4.47	33.799	199	26.807	127.1	4.46	124.8	3.85	3.50	2.98	1470.
241	4.13	33.856	247	26.888	119.7	4.11	117.1	4.44	4.87	2.06	1470.
297	4.00	33.920	295	26.953	114.0	3.98	111.0	5.01	6.44	1.72	1470.
396	3.81	34.029	393	27.058	104.6	3.78	100.9	6.09	10.25	1.20	1471.
497	3.68	34.138	493	27.158	95.9	3.65	91.4	7.10	14.84	0.84	1472.
602	3.48	34.196	597	27.224	90.3	3.44	85.1	8.07	20.31	0.79	1473.
781	3.20	34.281	774	27.318	82.3	3.15	76.1	9.61	31.18	0.70	1475.
973	2.88	34.363	964	27.412	73.9	2.81	67.0	11.11	44.57	0.66	1477.
1162	2.65	34.428	1156	27.485	67.8	2.57	60.2	12.49	59.58	0.67	1479.
1461	2.34	34.521	1445	27.585	58.9	2.24	50.5	14.33	84.30	0.68	1483.
1955	1.99	34.578	1931	27.659	52.9	1.86	43.3	17.05	131.77	1.33	1490.
2457	1.77	34.622	2424	27.711	48.8	1.60	38.1	19.59	188.88	2.03	1497.
2964	1.63	34.656	2921	27.749	46.1	1.41	34.3	21.99	255.08	2.60	1505.
3479	1.54	34.672	3425	27.768	45.1	1.27	32.1	24.34	332.14	2.98	1514.

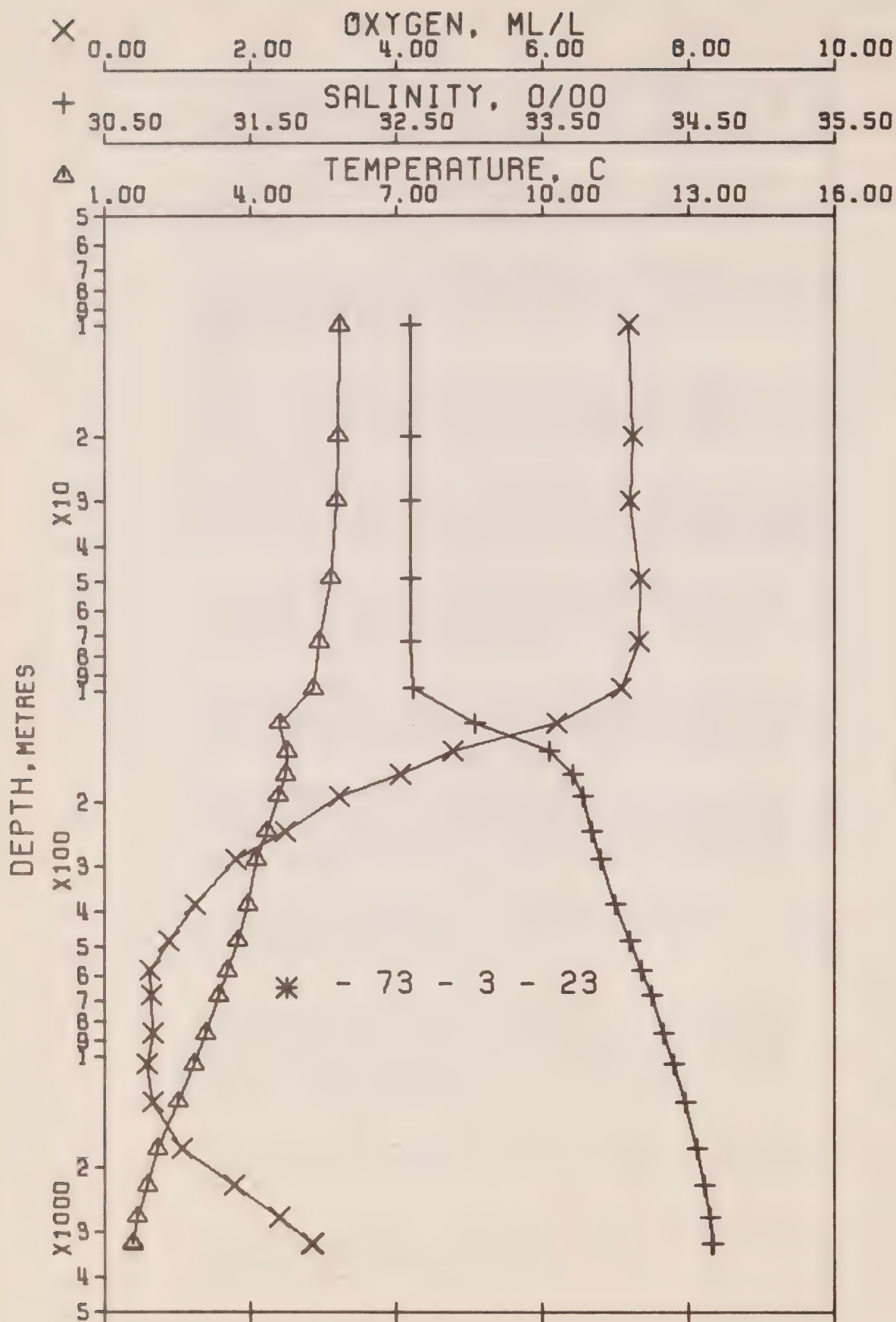


OFFSHORE OCEANOGRAPHY GROUP
 POSITION 49-58.0 N, 144-56.0 W GMT 19.6
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 3- 18

DATE 17/ 4/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	5.74	32.639	0	25.746	226.0	5.74	225.8	0.0	0.0	7.15	1471.
10	5.76	32.636	10	25.741	226.6	5.76	226.2	0.23	0.01	7.14	1471.
20	5.73	32.642	20	25.749	225.9	5.73	225.4	0.46	0.05	7.19	1471.
30	5.73	32.638	30	25.746	226.3	5.73	225.8	0.68	0.11	7.16	1471.
50	5.71	32.641	50	25.751	226.1	5.71	225.2	1.14	0.29	7.15	1472.
75	5.71	32.641	75	25.751	226.3	5.70	225.2	1.71	0.66	7.16	1472.
101	5.69	32.641	100	25.753	226.3	5.68	225.0	2.28	1.17	7.11	1472.
125	4.97	32.641	124	25.836	218.6	4.96	217.2	2.83	1.80	6.62	1470.
150	4.76	33.479	149	26.522	153.7	4.75	152.0	3.30	2.45	5.03	1470.
174	4.77	33.704	173	26.699	137.2	4.76	135.1	3.64	3.02	4.12	1471.
199	4.45	33.795	193	26.806	127.1	4.44	125.0	3.97	3.65	2.89	1470.
243	4.20	33.887*	247	26.905	118.1	4.18	115.5	4.57	5.03	2.05	1470.
298	4.08	33.930	296	26.952	114.0	4.06	111.1	5.14	6.62	1.55	1471.
397	3.86	34.033	394	27.057	104.9	3.83	101.1	6.23	10.46	1.08	1471.
497	3.66	34.123	493	27.148	96.8	3.63	92.3	7.23	15.04	0.78	1472.
595	3.51	34.189	594	27.215	91.0	3.47	85.9	8.19	20.40	0.67	1473.
786	3.19	34.377	779	27.395	75.1	3.14	68.8	9.74	31.26	0.60	1475.
986	2.90	34.392	976	27.434	72.1	2.83	65.1	11.19	44.42	0.59	1478.
1185	2.63	34.437	1173	27.493	67.0	2.55	59.3	12.58	59.79	0.63	1480.
1486	2.35	34.509	1470	27.575	60.0	2.25	51.5	14.49	85.74	0.83	1484.
1930	2.00	34.533	1966	27.662	52.8	1.86	42.9	17.30	135.70	1.30	1491.
2495	1.77	34.630	2463	27.718	48.3	1.59	37.5	19.35	193.94	1.88	1498.
3005	1.63	34.672	2961	27.762	45.1	1.41	33.0	22.21	260.03	2.59	1506.
3505	1.54	34.678	3450	27.773	44.8	1.27	31.6	24.44	334.02	3.11	1514.
3515	1.54	34.678	3460	27.773	44.8	1.27	31.6	24.48	335.67	3.07	1515.



DATE 30/ 4/73

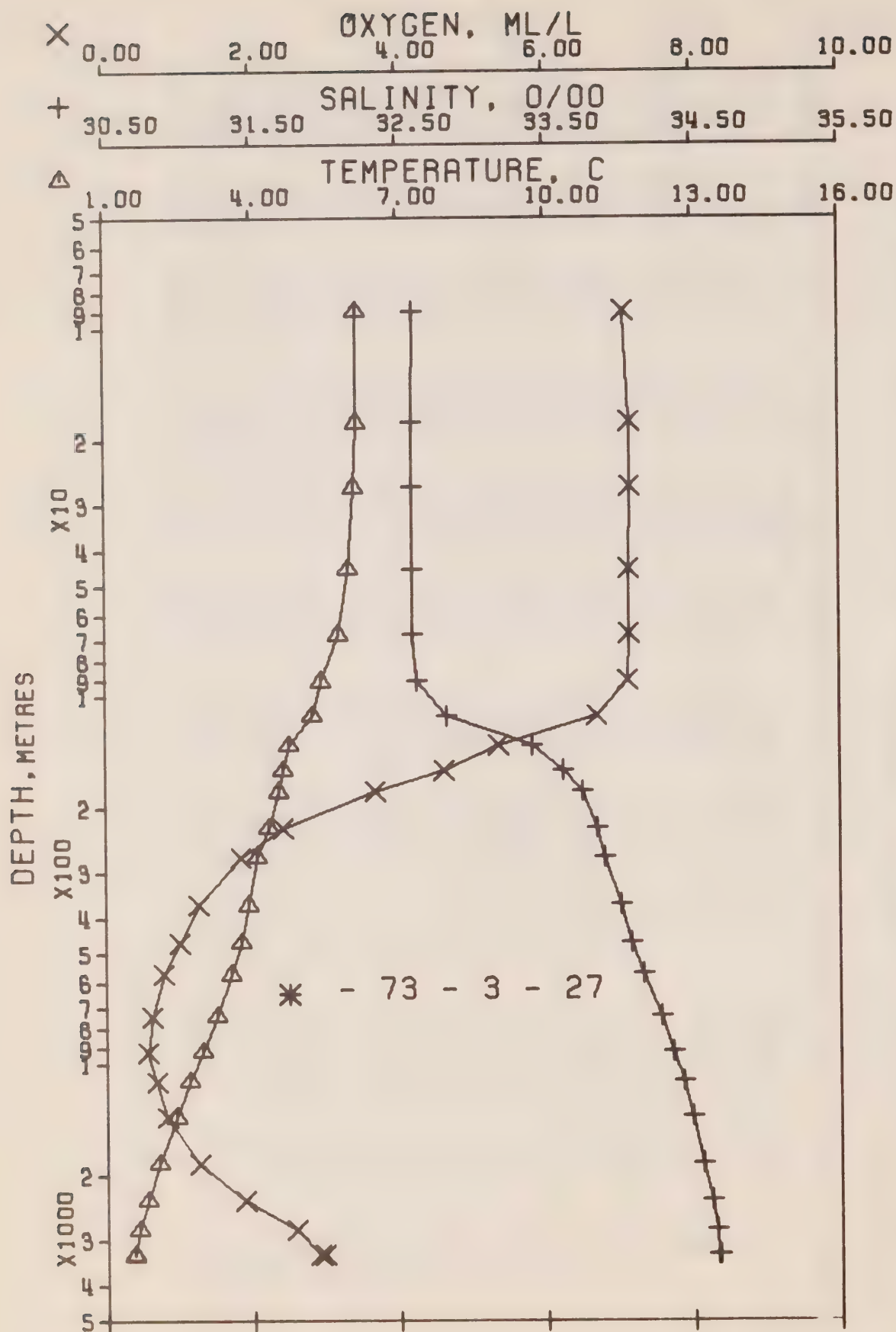
REFERENCE NO. 73- 3- 23

OFFSHORE OCEANOGRAPHY GROUP

POSITION 49-57.0 N. 144-55.0 W GMT 20.2

HYDROGRAPHIC CAST DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	5.30	32.604	0	25.711	229.3	5.80	229.1	0.0	0.0	7.42	1471.
10	5.34	32.603	10	25.705	230.0	5.84	229.7	0.23	0.01	7.18	1471.
20	5.30	32.603	20	25.710	229.6	5.80	229.1	0.45	0.05	7.25	1471.
30	5.77	32.598	30	25.710	229.8	5.77	229.2	0.69	0.11	7.20	1471.
49	5.65	32.603	49	25.728	228.2	5.65	227.4	1.13	0.28	7.34	1471.
73	5.40	32.604	73	25.758	225.5	5.39	224.6	1.68	0.63	7.31	1471.
99	5.29	32.616	99	25.780	223.7	5.28	222.4	2.25	1.13	7.09	1471.
123	4.61	33.037	122	26.188	185.0	4.60	183.6	2.75	1.69	6.19	1469.
147	4.76	33.552	146	26.580	148.2	4.75	146.4	3.15	2.24	4.78	1470.
170	4.72	33.711	169	26.710	136.1	4.71	134.0	3.47	2.77	4.06	1471.
194	4.58	33.795	193	26.784	129.2	4.57	127.1	3.79	3.36	3.23	1471.
243	4.32	33.839	241	26.855	122.9	4.30	120.3	4.40	4.71	2.47	1471.
290	4.13	33.896	288	26.920	117.1	4.11	114.0	4.97	6.26	1.81	1471.
387	3.93	34.000	384	27.023	108.0	3.90	104.3	6.06	10.01	1.25	1472.
485	3.72	34.098	481	27.122	99.2	3.69	94.8	7.07	14.52	0.88	1472.
580	3.51	34.184	581	27.211	91.4	3.47	86.3	8.03	19.76	0.63	1473.
685	3.34	34.251	680	27.281	85.3	3.29	79.7	8.91	25.48	0.65	1474.
872	3.08	34.330	864	27.368	77.9	3.02	71.3	10.43	37.50	0.66	1476.
1057	2.83	34.398	1047	27.445	71.3	2.76	64.0	11.81	51.07	0.58	1478.
1337	2.49	34.479	1323	27.539	63.1	2.40	54.9	13.68	73.92	0.66	1482.
1805	2.09	34.563	1784	27.639	54.6	1.97	45.3	16.40	117.56	1.06	1488.
2283	1.86	34.614	2254	27.698	49.9	1.70	39.4	18.88	169.31	1.79	1495.
2779	1.67	34.551	2740	27.742	46.4	1.47	35.0	21.26	230.57	2.41	1503.
3286	1.56	34.669	3236	27.765	45.1	1.31	32.6	23.29	294.90	2.86	1511.
3295	1.57	34.660	3245	27.757	46.0	1.32	33.4	23.34	296.46	2.84	1511.



DATE 12/ 5/73

REFERENCE NO. 73- 3- 27

OFFSHORE OCEANOGRAPHY GROUP

POSITION 50- 4.0 N, 145- 0.0 W GMT 19.4

HYDROGRAPHIC CAST DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	6.14	32.608	0	25.672	233.0	6.14	232.8	0.0	0.0	7.18	1472.
9	6.16	32.606	9	25.668	233.4	6.16	233.1	0.21	0.01	7.09	1473.
18	6.15	32.605	18	25.669	233.5	6.15	233.1	0.42	0.04	7.15	1473.
27	6.11	32.605	27	25.674	233.2	6.11	232.6	0.63	0.09	7.16	1473.
45	5.97	32.605	45	25.691	231.7	5.97	230.9	1.06	0.24	7.14	1473.
63	5.76	32.605	68	25.716	229.5	5.75	228.5	1.59	0.55	7.14	1472.
92	5.40	32.634	91	25.782	223.5	5.39	222.3	2.12	0.98	7.11	1471.
114	5.22	32.834	113	25.960	206.7	5.21	205.3	2.60	1.49	6.71	1471.
137	4.74	33.414	136	26.473	158.3	4.73	156.7	3.02	2.03	5.36	1470.
160	4.62	33.617	159	26.647	141.9	4.61	140.1	3.36	2.54	4.63	1470.
183	4.55	33.747	182	26.757	131.6	4.54	129.6	3.68	3.10	3.68	1470.
230	4.33	33.852	228	26.864	121.9	4.31	119.4	4.26	4.32	2.43	1470.
276	4.10	33.896	274	26.923	116.6	4.08	113.8	4.81	5.75	1.84	1470.
372	3.91	34.038	369	27.032	107.0	3.88	103.5	5.88	9.27	1.27	1471.
471	3.75	34.083	467	27.107	100.5	3.72	96.2	6.91	13.68	0.99	1472.
574	3.56	34.165	569	27.191	93.2	3.52	88.2	7.90	18.99	0.79	1473.
747	3.24	34.284	740	27.316	82.2	3.19	76.3	9.41	29.14	0.63	1475.
933	2.95	34.359	924	27.403	74.7	2.89	67.9	10.87	41.60	0.56	1477.
1121	2.69	34.427	1110	27.480	68.0	2.61	60.5	12.21	55.62	0.68	1479.
1405	2.41	34.491	1390	27.555	61.7	2.31	53.3	14.04	79.19	0.82	1482.
1884	2.05	34.558	1862	27.638	54.8	1.92	45.3	16.81	125.75	1.26	1489.
2371	1.80	34.618	2340	27.706	49.2	1.63	38.7	19.33	180.28	1.87	1496.
2865	1.64	34.649	2824	27.743	46.4	1.43	34.9	21.67	242.85	2.58	1504.
3354	1.55	34.664	3303	27.761	45.5	1.29	32.9	24.00	316.84	2.90	1512.
3365	1.54	34.666	3313	27.764	45.3	1.28	32.6	24.04	318.43	2.96	1512.

RESULTS OF STD CASTS

(P-73-3)

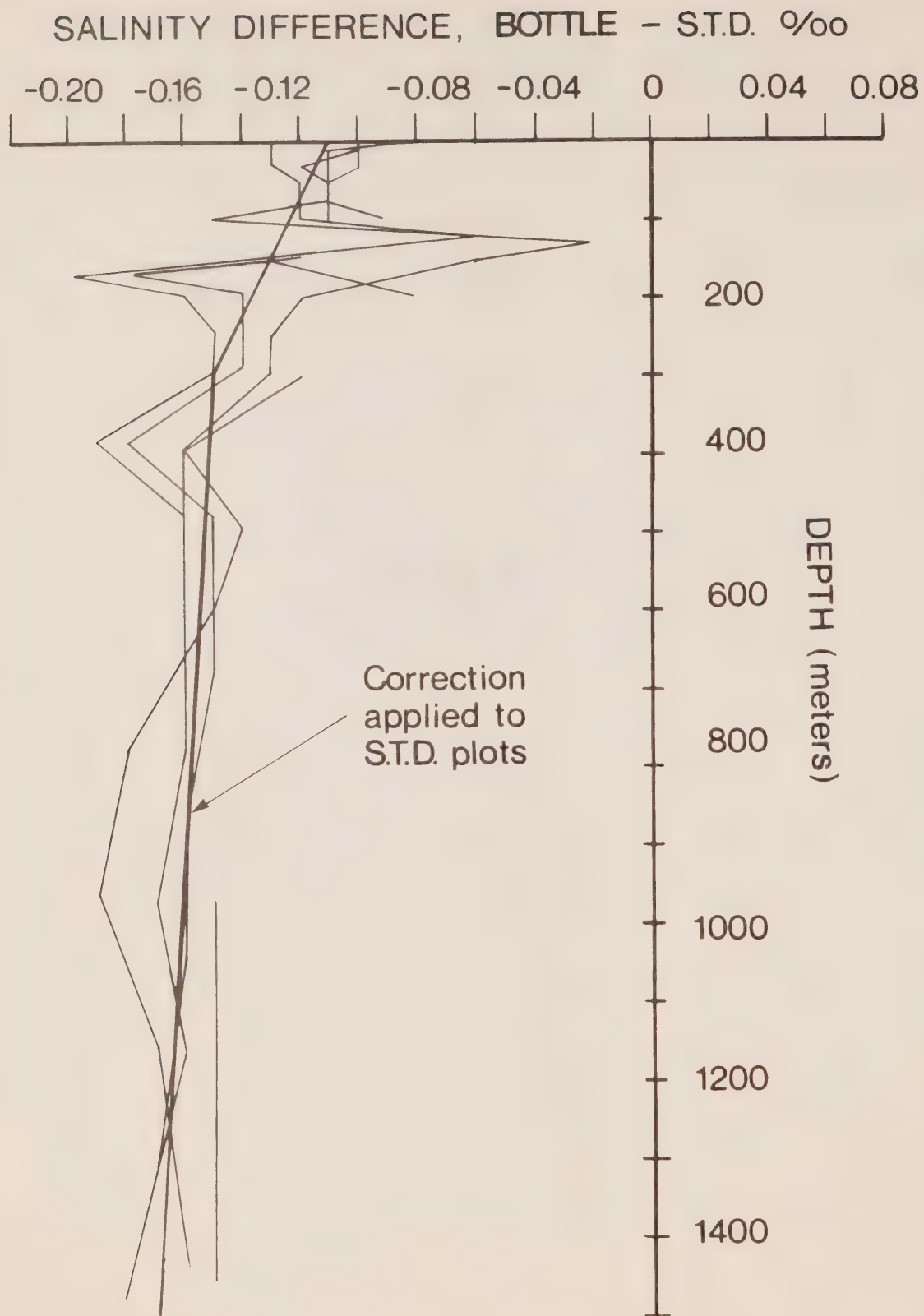


Figure 12 Salinity difference between hydro data and STD. P-73-3

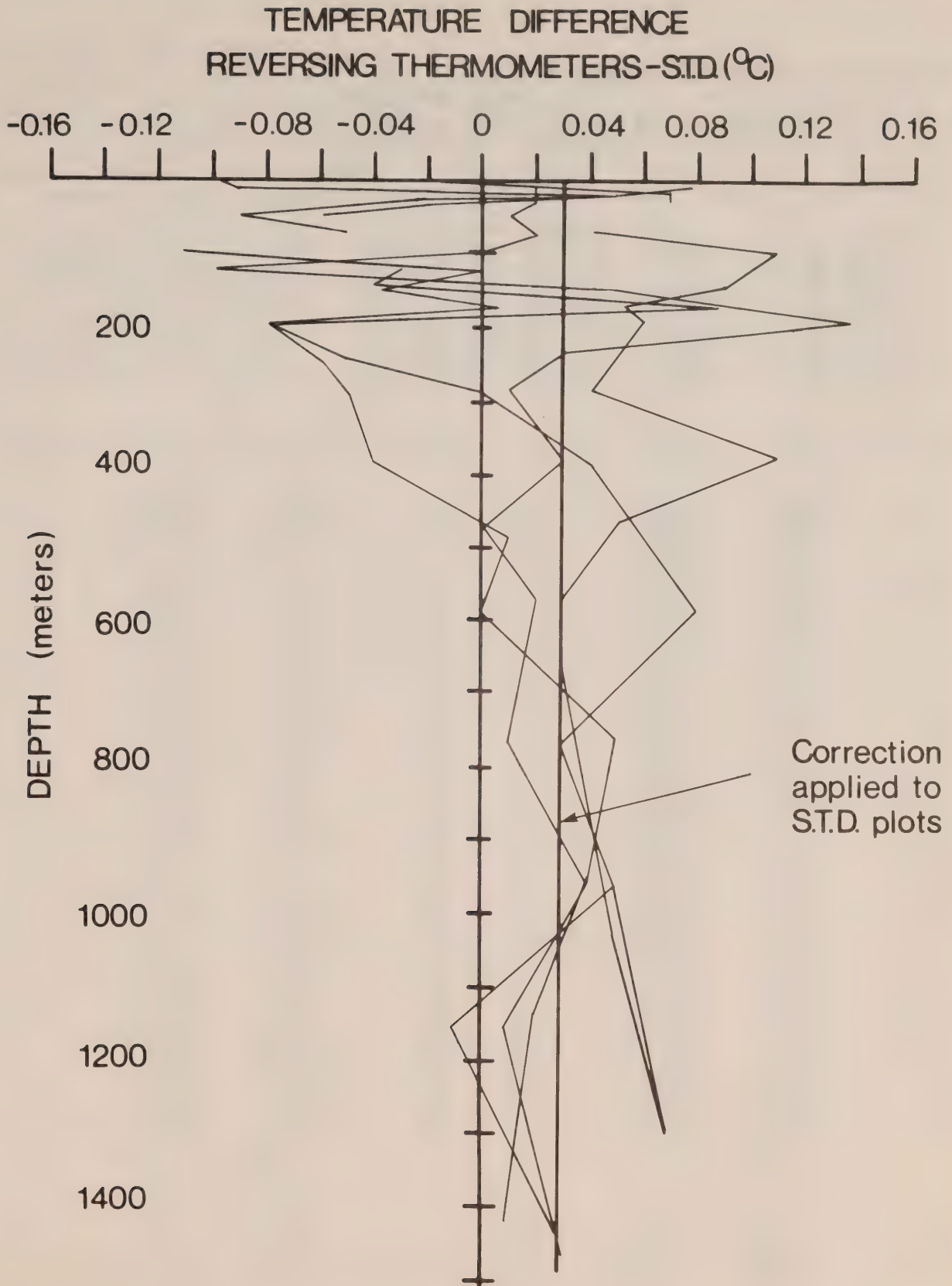


Figure 13

Temperature difference between hydro data and STD. P-73-3

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REFERENCE NO. 73- 3- 1

DATE 31/ 3/73

POSITION 48-33.0N, 125-33.0W GMT 1.5

RESULTS OF STP CAST 54 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.46	31.46	0	24.46	348.5	0.0	0.0	1480.
10	8.46	31.47	10	24.46	348.1	0.35	0.02	1480.
20	8.30	31.62	20	24.60	334.9	0.69	0.07	1480.
30	8.46	32.16	30	25.00	297.0	1.00	0.15	1481.
50	8.93	32.65	50	25.32	267.8	1.55	0.37	1484.
75	8.95	32.98	75	25.58	242.6	2.19	0.78	1485.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	8.46	31.46	47.	8.93	32.61
7.	8.46	31.47	50.	8.93	32.65
9.	8.46	31.47	51.	8.93	32.66
10.	8.46	31.47	52.	8.92	32.70
13.	8.45	31.49	53.	8.90	32.71
14.	8.45	31.51	54.	8.90	32.72
15.	8.42	31.53	57.	8.90	32.74
18.	8.35	31.57	60.	8.89	32.75
19.	8.32	31.60	61.	8.89	32.76
21.	8.29	31.64	63.	8.86	32.79
22.	8.22	31.74	64.	8.85	32.82
22.	8.18	31.91	65.	8.86	32.84
24.	8.17	32.02	66.	8.86	32.89
25.	8.25	32.09	67.	8.89	32.90
26.	8.31	32.13	69.	8.90	32.93
28.	8.42	32.14	73.	8.86	32.96
30.	8.46	32.16	76.	8.85	32.99
30.	8.48	32.16	76.	8.84	33.00
32.	8.52	32.25	77.	8.81	33.06
32.	8.61	32.31	78.	8.79	33.13
34.	8.80	32.38	80.	8.74	33.17
36.	8.86	32.46	82.	8.69	33.19
36.	8.88	32.47	84.	8.69	33.20
39.	8.93	32.52	86.	8.69	33.20
40.	8.93	32.53	86.	8.69	33.21
43.	8.93	32.57	87.	8.68	33.22
43.	8.93	32.60	88.	8.67	33.22

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REFERENCE NO. 73- 3- 2

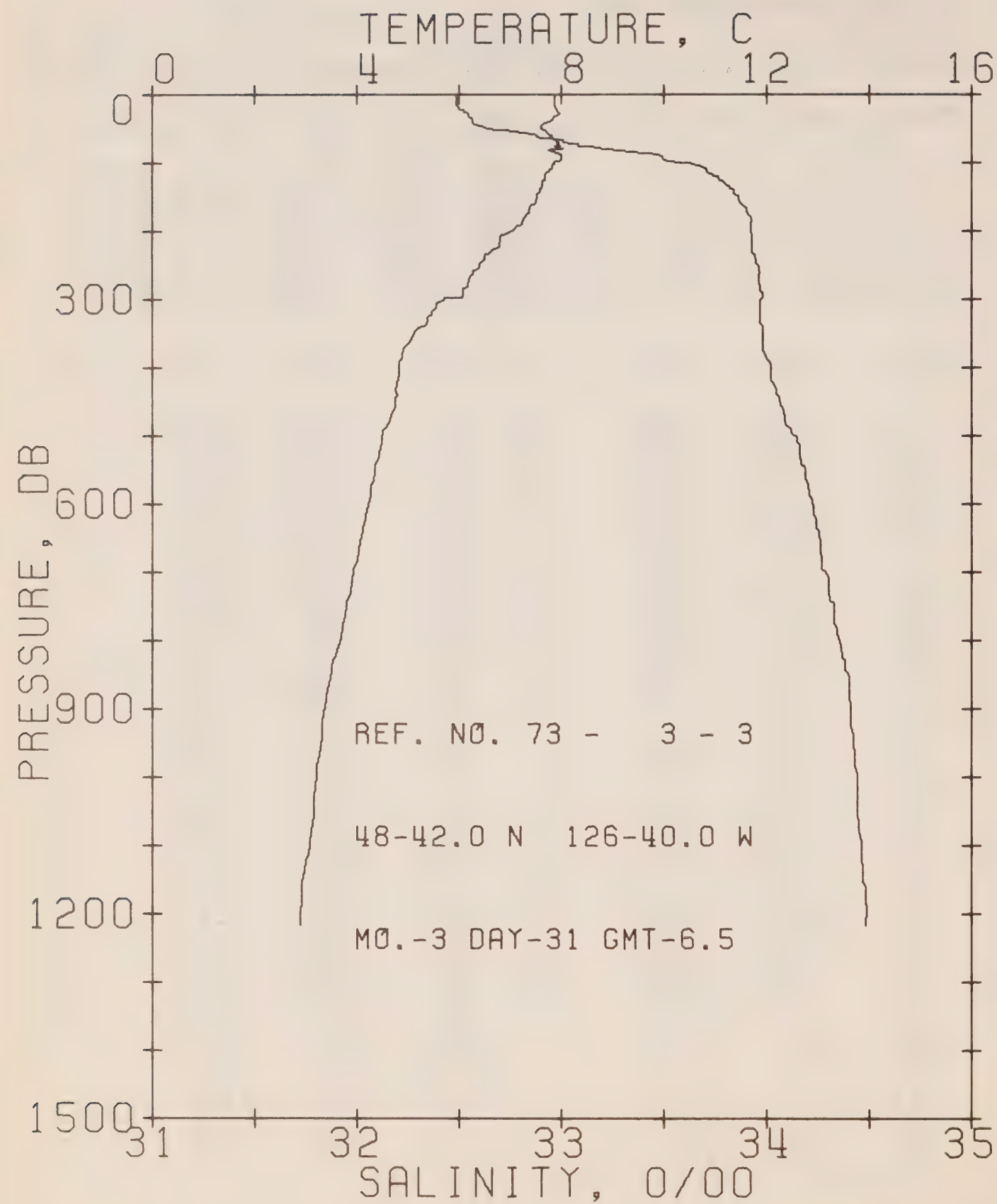
DATE 31/ 3/73

POSITION 48-38.0N, 126- 0.0W GMT 3.5

RESULTS OF STP CAST 67 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOJND
0	8.59	31.01	0	24.09	383.8	0.0	0.0	1480.
10	8.61	31.02	10	24.09	383.9	0.38	0.02	1480.
20	8.64	31.33	20	24.33	361.2	0.76	0.08	1481.
30	8.69	32.16	30	24.97	299.9	1.08	0.16	1482.
50	8.70	32.62	50	25.33	266.6	1.63	0.38	1483.
75	8.93	32.37	75	25.49	251.9	2.28	0.30	1485.
100	8.98	33.17	99	25.71	230.8	2.89	1.33	1486.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	8.59	31.01	61.	8.71	32.68
7.	8.60	31.01	63.	8.74	32.70
12.	8.61	31.02	65.	8.78	32.72
12.	8.61	31.03	66.	8.80	32.72
15.	8.62	31.06	68.	8.82	32.77
16.	8.63	31.13	69.	8.88	32.77
19.	8.64	31.21	70.	8.89	32.78
20.	8.64	31.33	71.	8.89	32.80
21.	8.64	31.49	72.	8.89	32.80
21.	8.64	31.63	73.	8.90	32.81
22.	8.65	31.77	75.	8.93	32.37
23.	8.66	31.85	78.	8.93	32.37
23.	8.66	31.94	80.	8.93	32.91
24.	8.66	32.04	81.	8.98	32.99
25.	8.66	32.08	82.	9.02	33.03
26.	8.63	32.09	82.	9.05	33.04
29.	8.69	32.13	84.	9.07	33.05
31.	8.69	32.20	85.	9.07	33.06
32.	8.69	32.25	86.	9.06	33.06
33.	8.70	32.29	87.	9.05	33.07
35.	8.71	32.35	91.	9.03	33.08
36.	8.74	32.42	93.	9.02	33.09
37.	8.74	32.47	94.	9.02	33.13
39.	8.74	32.49	95.	9.04	33.13
41.	8.70	32.58	96.	9.02	33.13
42.	8.70	32.59	97.	9.01	33.16
44.	8.70	32.59	98.	8.99	33.16
44.	8.70	32.61	99.	8.98	33.17
48.	8.70	32.62	100.	8.98	33.17
50.	8.70	32.62	101.	8.97	33.19
54.	8.70	32.63	101.	8.95	33.21
57.	8.69	32.63	103.	8.91	33.26
59.	8.69	32.63	104.	8.88	33.26
60.	8.69	32.65			



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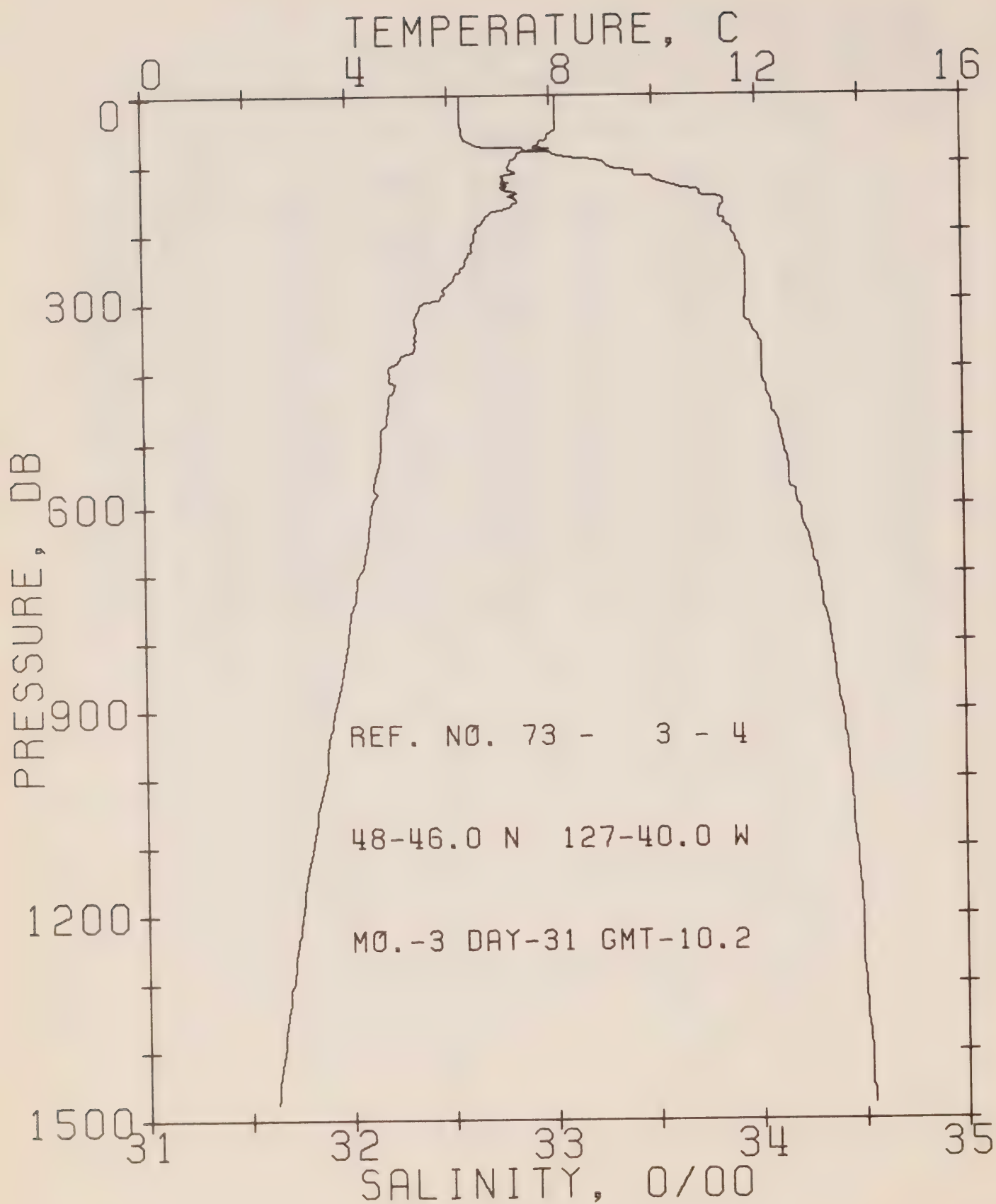
REFERENCE NO. 73- 3- 3

DATE 31/ 3/73

POSITION 48-42.0N, 126-40.0W GMT 6.5

RESULTS OF STP CAST 250 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.87	32.48	0	25.34	264.3	0.0	0.0	1479.
10	7.87	32.49	10	25.35	263.9	0.26	0.01	1479.
20	7.89	32.50	20	25.35	263.7	0.53	0.05	1480.
30	7.93	32.55	30	25.39	260.6	0.79	0.12	1480.
50	7.61	32.64	50	25.50	249.8	1.30	0.33	1479.
75	7.88	33.08	75	25.81	221.2	1.89	0.70	1481.
100	7.84	33.56	99	26.19	185.3	2.39	1.14	1482.
125	7.67	33.77	124	26.38	168.0	2.82	1.64	1482.
150	7.52	33.86	149	26.47	159.3	3.23	2.21	1482.
175	7.33	33.91	174	26.54	153.4	3.62	2.86	1482.
200	7.03	33.92	199	26.59	149.0	4.00	3.58	1481.
225	6.73	33.93	223	26.64	144.6	4.36	4.37	1480.
250	6.39	33.95	248	26.70	138.9	4.71	5.23	1479.
300	5.69	33.97	298	26.81	129.0	5.39	7.12	1477.
400	4.83	34.02	397	26.94	116.5	6.62	11.50	1476.
500	4.49	34.14	496	27.08	104.7	7.74	16.65	1476.
600	4.21	34.22	595	27.17	96.2	8.75	22.27	1477.
800	3.66	34.35	793	27.33	82.1	10.54	34.97	1478.
1000	3.19	34.44	990	27.44	71.8	12.05	48.45	1479.
1200	2.88	34.49	1188	27.51	66.0	13.44	64.40	1481.



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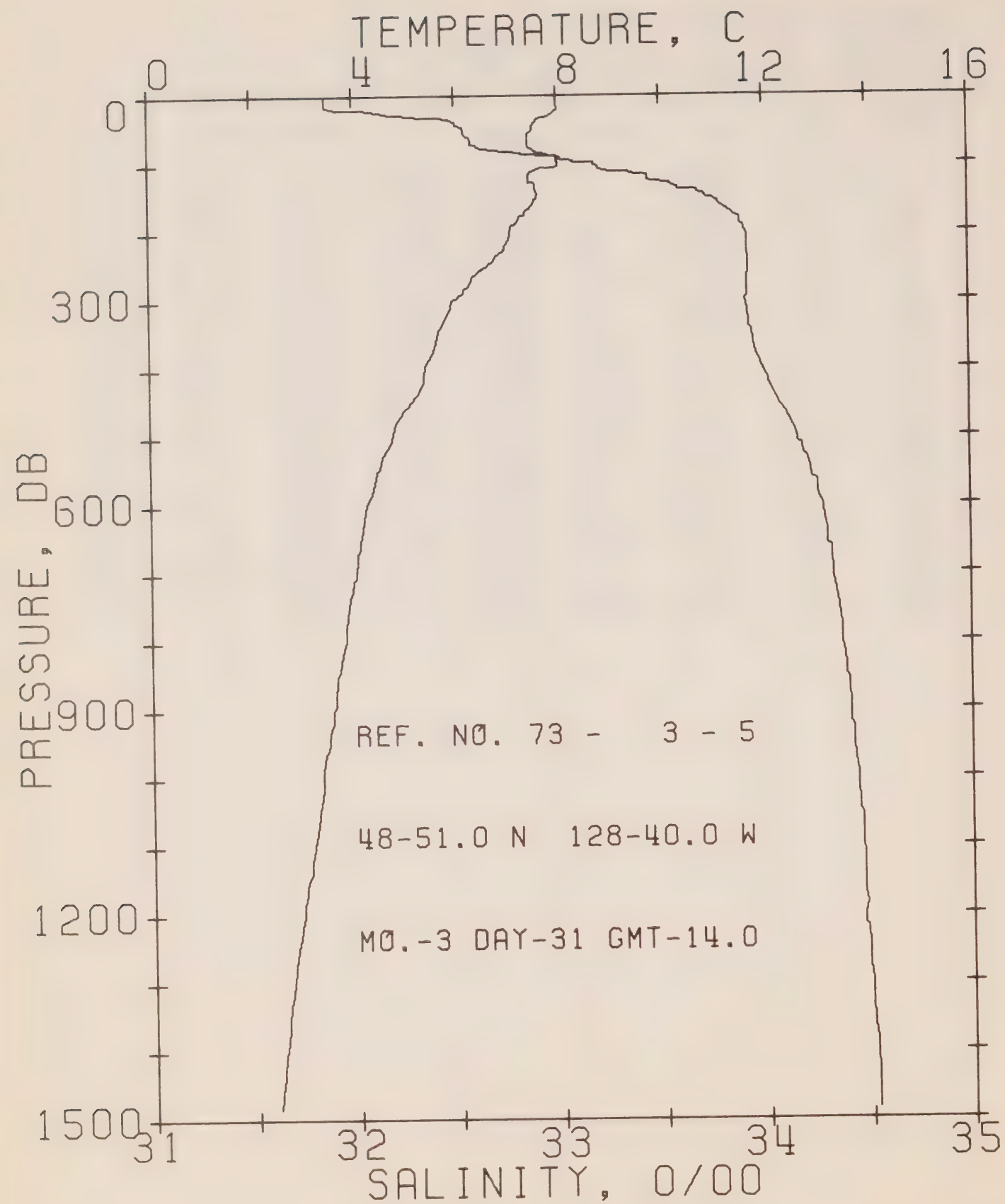
REFERENCE NO. 73- 3- 4

DATE 31/ 3/73

POSITION 48-46.0N, 127-40.0W GMT 10.2

RESULTS OF STP CAST 253 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.11	32.56	0	25.37	261.7	0.0	0.0	1480.
10	8.11	32.56	10	25.37	262.1	0.26	0.01	1480.
20	8.11	32.56	20	25.37	262.2	0.52	0.05	1480.
30	8.11	32.56	30	25.37	262.3	0.79	0.12	1481.
50	8.10	32.57	50	25.38	261.9	1.31	0.33	1481.
75	7.69	32.68	75	25.52	248.3	1.96	0.74	1480.
100	7.22	33.27	99	26.05	198.6	2.50	1.23	1479.
125	7.06	33.52	124	26.27	178.1	2.98	1.77	1479.
150	7.27	33.81	149	26.47	159.4	3.40	2.36	1481.
175	6.78	33.82	174	26.54	152.8	3.79	3.01	1479.
200	6.55	33.88	199	26.62	145.6	4.16	3.72	1479.
225	6.46	33.92	223	26.67	141.8	4.52	4.50	1479.
250	6.29	33.95	248	26.71	137.7	4.87	5.34	1479.
300	5.80	33.94	293	26.77	132.7	5.54	7.23	1478.
400	4.81	34.02	397	26.94	116.3	6.78	11.64	1475.
500	4.65	34.11	496	27.04	108.6	7.91	16.83	1477.
600	4.44	34.20	595	27.13	100.8	8.97	22.72	1477.
800	3.96	34.35	793	27.30	85.7	10.82	35.92	1479.
1000	3.47	34.44	991	27.42	75.1	12.43	50.53	1480.
1200	2.99	34.49	1188	27.50	67.2	13.85	66.48	1482.



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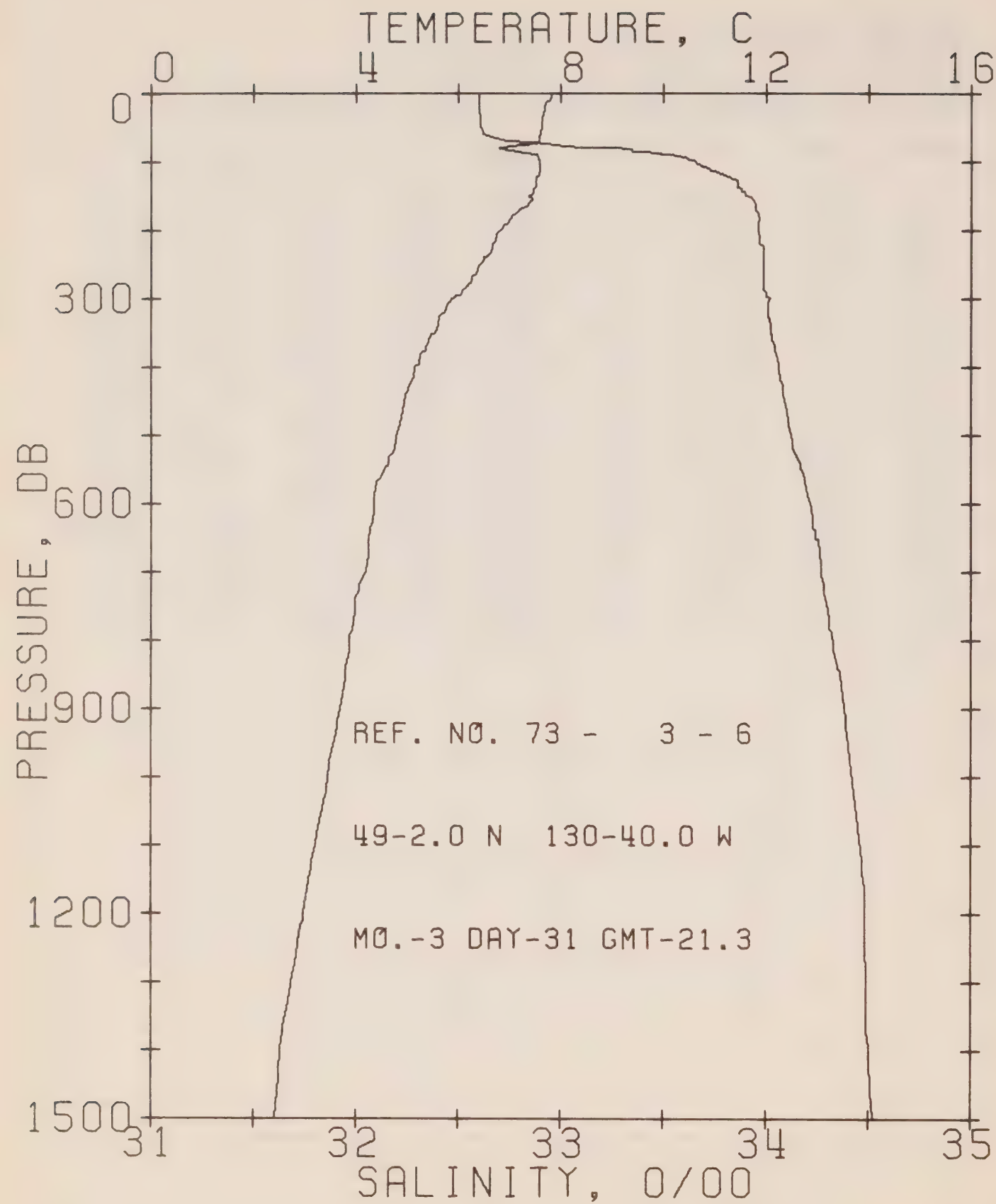
REFERENCE NO. 73- 3- 5

DATE 31/ 3/73

POSITION 48-51.0N, 123-40.0W GMT 14.0

RESULTS OF STD CAST 233 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SWA	DELTA D	POT. EN	SOUND
0	8.00	31.86	0	24.84	312.3	0.0	0.0	1479.
10	8.01	31.87	10	24.84	312.0	0.31	0.02	1479.
20	8.03	31.92	20	24.88	308.7	0.62	0.06	1479.
30	7.83	32.26	30	25.17	280.8	0.92	0.14	1479.
50	7.52	32.54	50	25.44	256.1	1.44	0.35	1479.
75	7.46	32.61	75	25.50	250.1	2.07	0.75	1479.
100	8.02	33.18	99	25.87	216.1	2.66	1.27	1482.
125	7.43	33.47	124	26.18	186.8	3.16	1.85	1481.
150	7.50	33.73	149	26.36	169.9	3.60	2.47	1482.
175	7.35	33.86	174	26.50	157.4	4.01	3.15	1482.
200	7.07	33.91	199	26.58	150.1	4.39	3.88	1481.
225	6.96	33.92	223	26.60	148.4	4.77	4.68	1481.
250	6.62	33.93	248	26.65	143.5	5.13	5.57	1480.
300	5.96	33.91	298	26.72	137.0	5.83	7.53	1478.
400	5.39	33.99	397	26.85	125.5	7.15	12.21	1478.
500	4.73	34.16	496	27.06	106.2	8.31	17.52	1477.
600	4.23	34.28	595	27.21	92.3	9.30	23.05	1477.
800	3.76	34.37	793	27.33	82.0	11.03	35.37	1478.
1000	3.32	34.44	991	27.43	73.2	12.57	49.52	1480.
1200	2.91	34.47	1183	27.50	67.7	13.98	65.21	1481.



OFFSHORE OCEANOGRAPHY GROUP

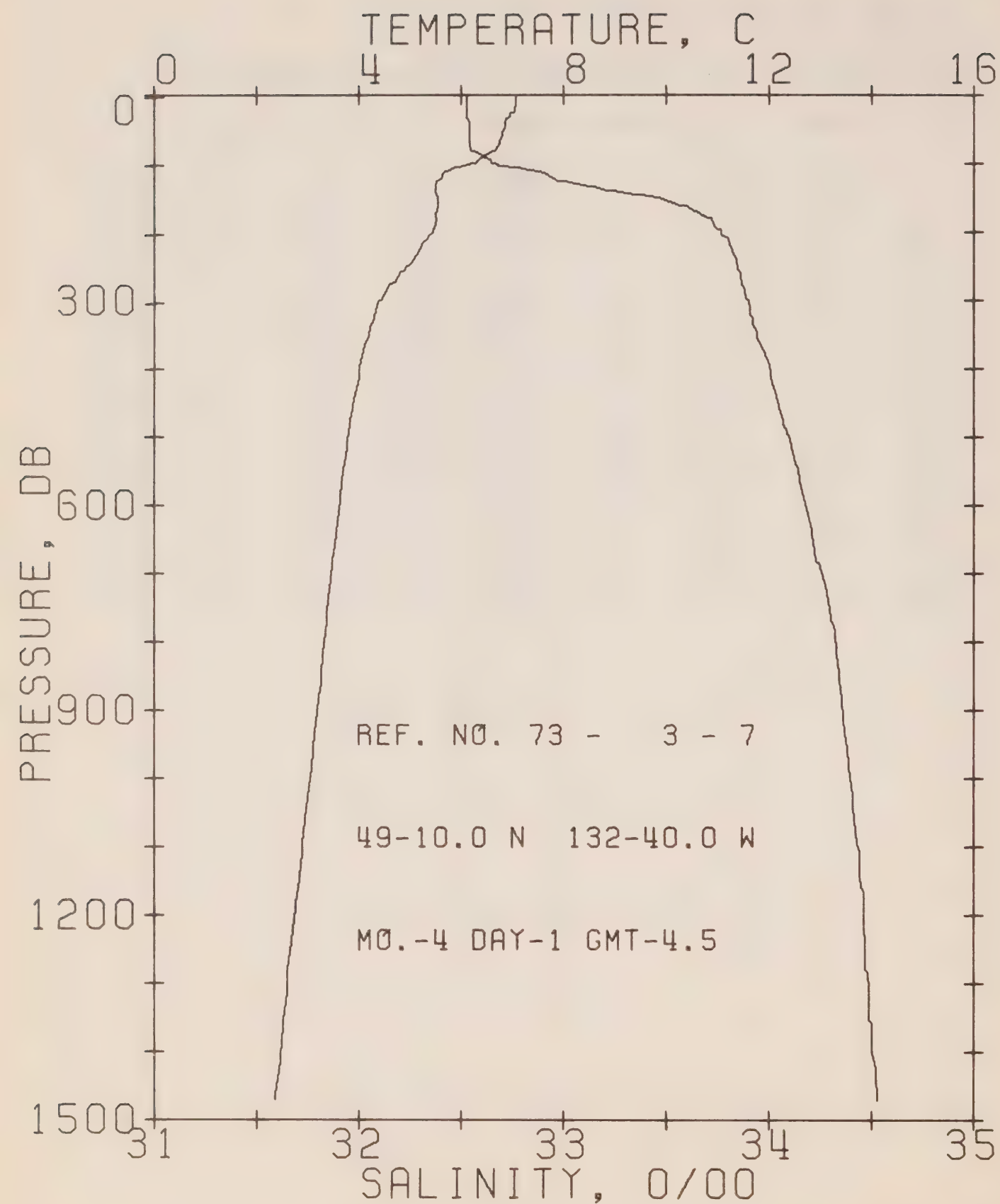
REFERENCE NO. 73- 3- 6

DATE 31/ 3/73

POSITION 49- 2.0N, 130-40.0W GMT 21.3

RESULTS OF STP CAST 217 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.80	32.60	0	25.44	254.4	0.0	0.0	1479.
10	7.79	32.60	10	25.45	254.7	0.25	0.01	1479.
20	7.67	32.60	20	25.46	253.2	0.51	0.05	1479.
30	7.66	32.60	30	25.46	253.2	0.76	0.12	1479.
50	7.62	32.61	50	25.48	252.1	1.27	0.32	1479.
75	7.25	32.97	75	25.81	220.8	1.83	0.71	1479.
100	7.59	33.65	99	26.30	175.0	2.36	1.13	1481.
125	7.52	33.83	124	26.45	160.9	2.78	1.62	1482.
150	7.42	33.90	149	26.52	155.0	3.17	2.17	1482.
175	7.11	33.96	174	26.61	146.7	3.55	2.80	1481.
200	6.84	33.96	199	26.65	143.4	3.91	3.49	1480.
225	6.66	33.98	223	26.69	139.6	4.27	4.25	1480.
250	6.43	33.99	248	26.72	136.5	4.61	5.09	1480.
300	5.88	34.02	299	26.82	128.0	5.28	6.97	1478.
400	5.17	34.06	397	26.94	117.6	6.52	11.36	1477.
500	4.79	34.12	496	27.03	109.7	7.65	16.57	1477.
600	4.34	34.21	595	27.15	98.4	8.69	22.33	1477.
800	3.87	34.32	793	27.29	86.6	10.54	35.56	1479.
1000	3.44	34.42	990	27.40	76.3	12.17	50.40	1480.
1200	2.96	34.48	1183	27.50	67.5	13.59	66.33	1481.



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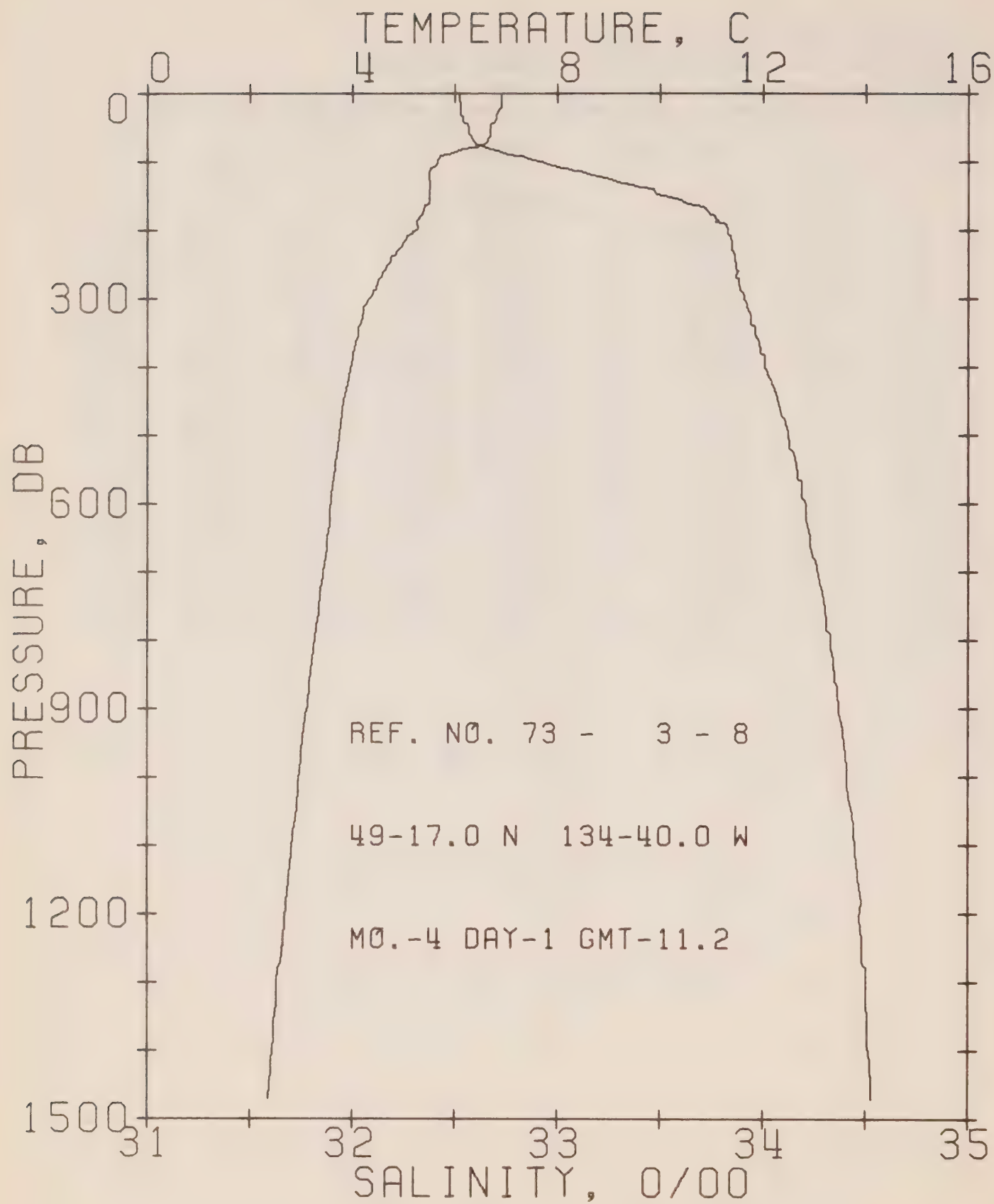
REFERENCE NO. 73- 3- 7

DATE 1/ 4/73

POSITION 49-10.0N, 132-40.0W GMT 4.5

RESULTS OF STD CAST 175 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.06	32.53	0	25.49	249.9	0.0	0.0	1476.
10	7.06	32.53	10	25.49	250.2	0.25	0.01	1476.
20	7.04	32.53	20	25.49	250.1	0.50	0.05	1476.
30	6.96	32.53	30	25.51	249.2	0.75	0.11	1476.
50	6.83	32.54	50	25.53	247.1	1.25	0.32	1476.
75	6.70	32.54	75	25.55	245.8	1.86	0.71	1476.
100	6.26	32.65	99	25.69	232.4	2.46	1.24	1475.
125	5.54	32.97	124	26.03	200.2	2.99	1.85	1473.
150	5.54	33.44	149	26.40	165.3	3.45	2.49	1474.
175	5.50	33.68	174	26.60	147.3	3.84	3.13	1474.
200	5.43	33.77	199	26.68	140.0	4.20	3.82	1474.
225	5.17	33.92	223	26.75	133.5	4.54	4.56	1474.
250	4.97	33.85	248	26.79	129.3	4.87	5.36	1473.
300	4.44	33.90	293	26.89	120.2	5.49	7.10	1472.
400	4.00	34.00	397	27.02	108.7	6.64	11.18	1472.
500	3.78	34.09	496	27.11	100.1	7.69	15.98	1473.
600	3.61	34.19	595	27.20	93.0	8.65	21.38	1474.
800	3.31	34.32	793	27.34	80.3	10.38	33.67	1476.
1000	3.03	34.40	990	27.43	73.3	11.92	47.77	1478.
1200	2.73	34.46	1183	27.50	66.4	13.31	63.37	1480.



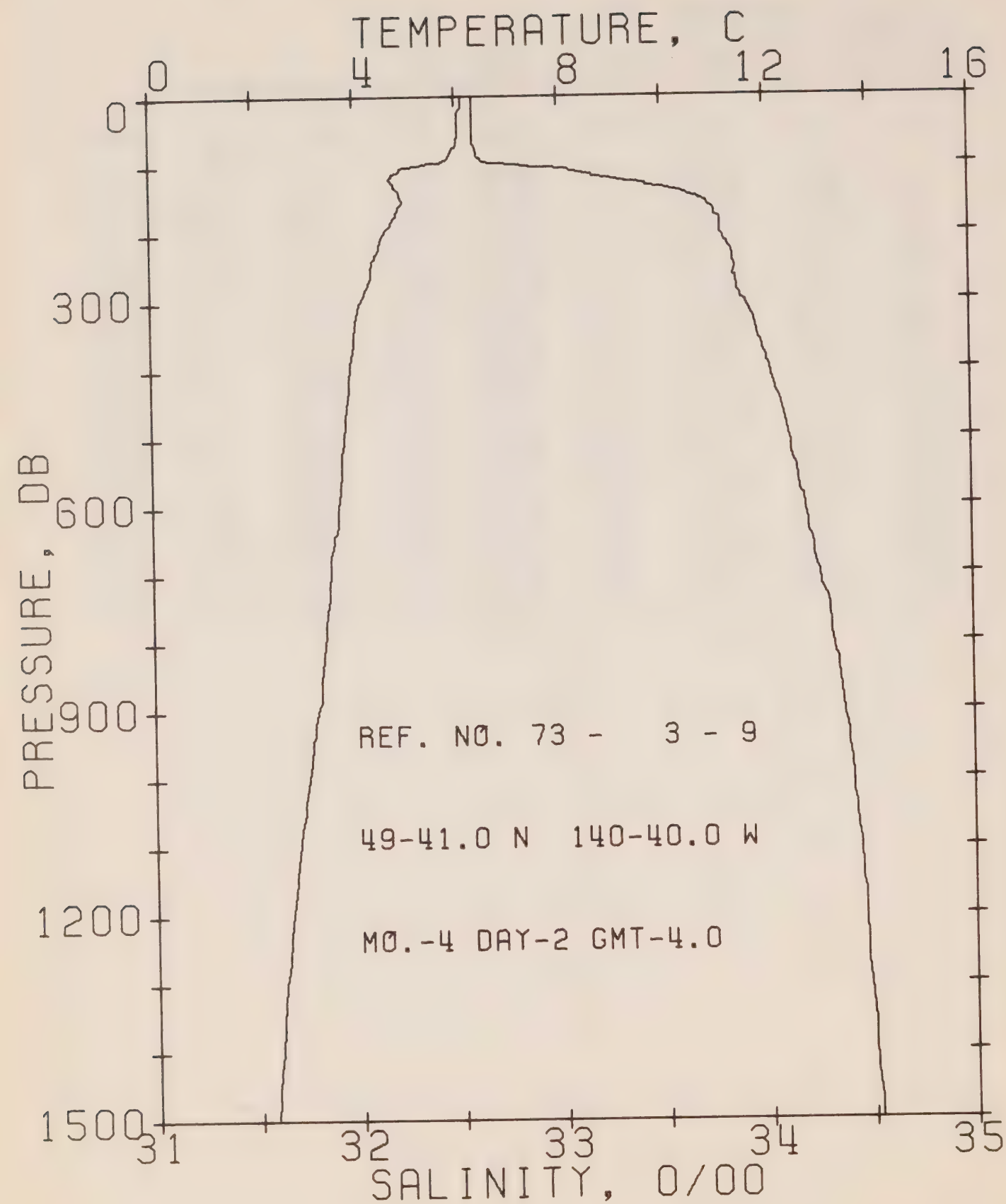
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REFERENCE NO. 73- 3- 8 DATE 1/ 4/73

POSITION 49-17.0N, 134-40.0W GMT 11.2

RESULTS OF STP CAST 205 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	PJT. EN	SOUND
0	6.91	32.52	0	25.50	248.7	0.0	0.0	1475.
10	6.91	32.52	10	25.51	248.9	0.25	0.01	1476.
20	6.91	32.53	20	25.51	248.5	0.50	0.05	1476.
30	6.82	32.53	30	25.52	247.5	0.75	0.11	1476.
50	6.69	32.56	50	25.57	243.6	1.24	0.31	1475.
75	6.55	32.60	75	25.61	239.4	1.84	0.70	1475.
100	5.65	32.92	99	25.98	205.0	2.40	1.19	1473.
125	5.50	33.24	124	26.25	179.2	2.88	1.74	1473.
150	5.50	33.52	149	26.47	158.9	3.30	2.33	1474.
175	5.37	33.74	174	26.66	141.6	3.67	2.95	1474.
200	5.26	33.83	199	26.74	133.5	4.02	3.61	1474.
225	4.93	33.85	223	26.80	128.5	4.34	4.31	1473.
250	4.69	33.87	248	26.84	124.6	4.66	5.08	1472.
300	4.32	33.91	298	26.91	119.1	5.27	6.79	1472.
400	3.96	34.01	397	27.03	107.7	6.39	10.79	1472.
500	3.73	34.12	496	27.14	97.7	7.42	15.47	1473.
600	3.56	34.20	595	27.22	90.5	8.36	20.74	1474.
800	3.24	34.33	793	27.35	79.2	10.07	32.89	1476.
1000	2.94	34.41	990	27.44	71.3	11.57	46.67	1478.
1200	2.67	34.47	1188	27.52	64.8	12.93	61.86	1480.



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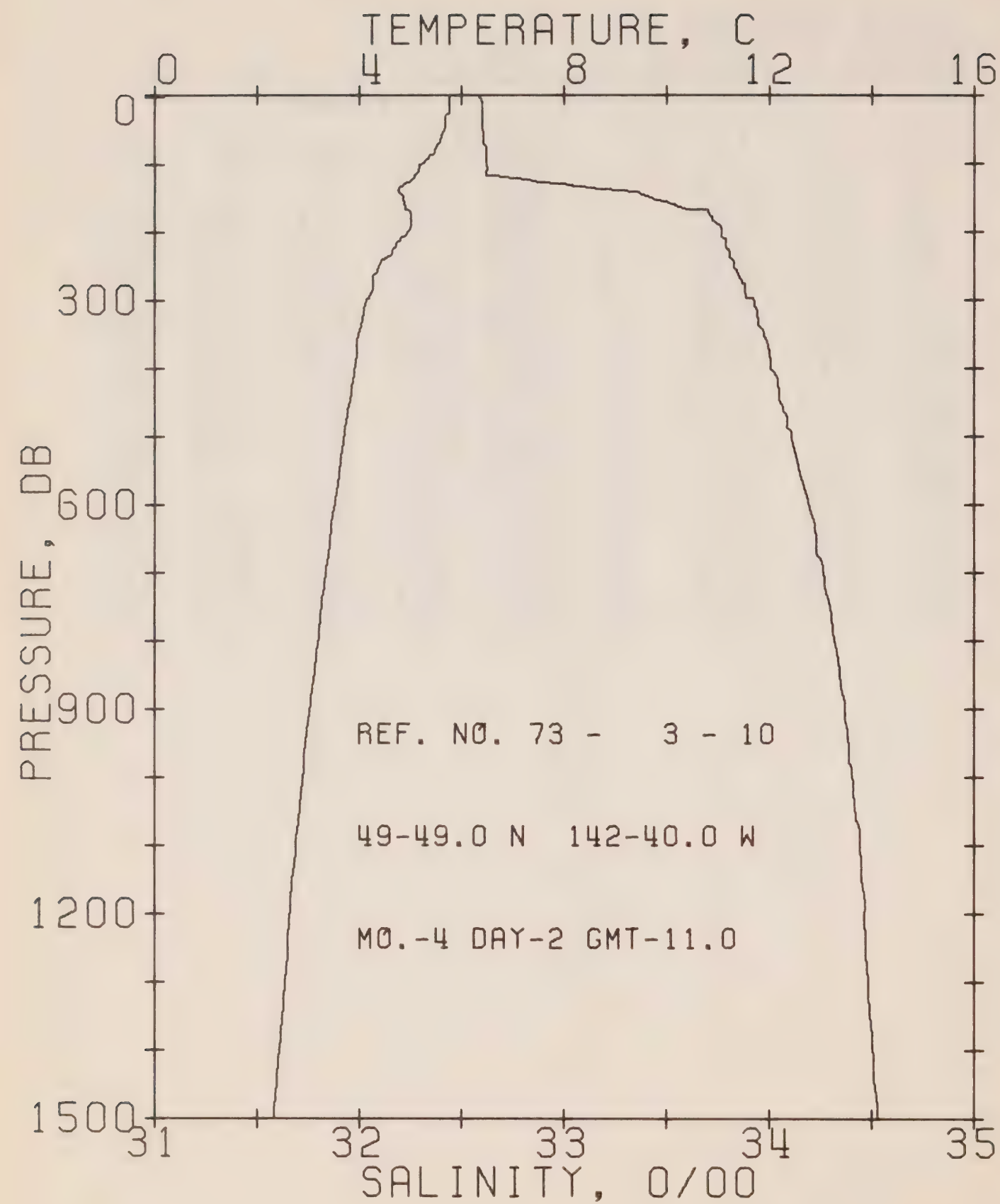
REFERENCE NO. 73- 3- 9

DATE 2/ 4/73

POSITION 49-41.0N, 140-40.0W GMT 4.0

RESULTS OF STD CAST 180 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.12	32.59	0	25.66	233.8	0.0	0.0	1472.
10	6.13	32.59	10	25.66	234.3	0.23	0.01	1473.
20	6.09	32.59	20	25.66	233.9	0.47	0.05	1473.
30	6.06	32.59	30	25.67	233.7	0.70	0.11	1473.
50	6.05	32.59	50	25.67	233.8	1.17	0.30	1473.
75	5.99	32.60	75	25.68	232.8	1.75	0.67	1473.
100	5.37	32.79	99	25.91	211.6	2.33	1.18	1471.
125	4.75	33.33	124	26.41	164.6	2.79	1.71	1470.
150	4.23	33.68	149	26.66	140.6	3.16	2.23	1471.
175	4.83	33.76	174	26.74	133.7	3.50	2.79	1472.
200	4.60	33.79	199	26.79	129.1	3.83	3.42	1471.
225	4.45	33.84	223	26.84	124.5	4.15	4.10	1471.
250	4.33	33.86	248	26.87	121.7	4.45	4.35	1471.
300	4.12	33.90	298	26.93	116.4	5.05	6.53	1471.
400	3.90	34.02	397	27.04	106.1	6.16	10.48	1472.
500	3.77	34.11	496	27.13	98.8	7.18	15.15	1473.
600	3.64	34.19	595	27.20	92.6	8.14	20.53	1474.
800	3.34	34.32	793	27.33	81.1	9.87	32.83	1476.
1000	2.98	34.41	990	27.44	71.7	11.40	46.79	1478.
1200	2.64	34.46	1188	27.51	65.4	12.77	62.09	1480.



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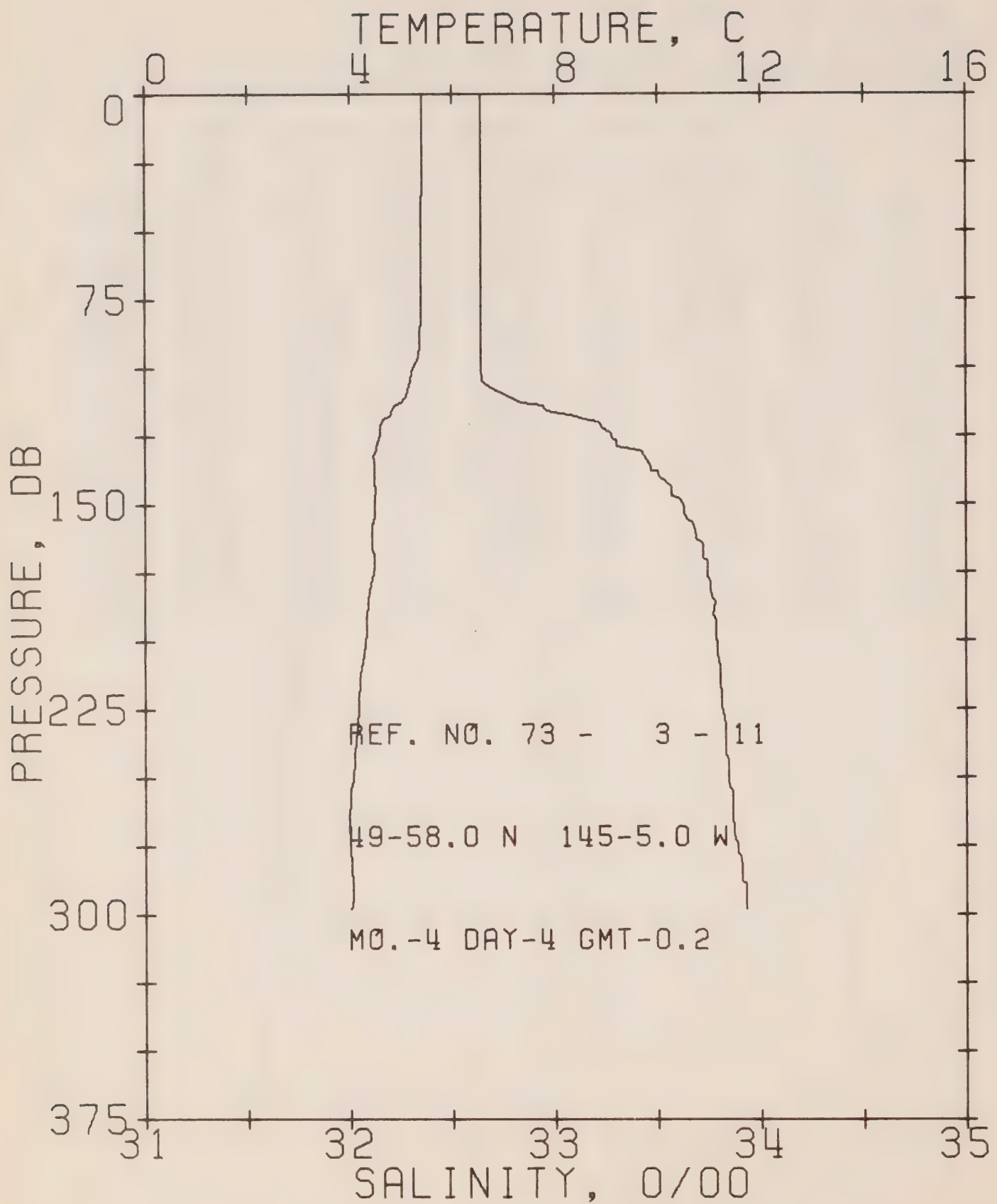
REFERENCE NO. 73- 3- 10

DATE 2/ 4/73

POSITION 49-49.0N, 142-40.0W GMT 11.0

RESULTS OF STD CAST 182 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	PJT. EN	SOUND
0	5.75	32.59	0	25.71	229.6	0.0	0.0	1471.
10	5.75	32.60	10	25.71	229.4	0.23	0.01	1471.
20	5.76	32.60	20	25.71	229.4	0.46	0.05	1471.
30	5.69	32.60	30	25.72	228.6	0.69	0.11	1471.
50	5.66	32.60	50	25.72	228.5	1.15	0.29	1471.
75	5.49	32.62	75	25.76	225.7	1.71	0.65	1471.
100	5.24	32.62	99	25.79	222.9	2.27	1.15	1470.
125	5.01	32.84	124	25.99	204.0	2.82	1.78	1470.
150	4.35	33.43	149	26.47	158.3	3.27	2.40	1471.
175	5.01	33.71	174	26.68	139.5	3.64	3.02	1472.
200	4.95	33.77	199	26.73	134.5	3.98	3.68	1472.
225	4.67	33.79	223	26.78	129.8	4.31	4.39	1472.
250	4.38	33.83	248	26.84	124.2	4.63	5.16	1471.
300	4.13	33.92	298	26.94	115.2	5.24	6.35	1471.
400	3.91	34.01	397	27.03	107.1	6.34	10.79	1472.
500	3.69	34.11	496	27.13	98.2	7.37	15.49	1473.
600	3.52	34.19	595	27.22	91.1	8.32	20.80	1474.
800	3.18	34.32	793	27.35	79.6	10.01	32.86	1475.
1000	2.98	34.40	990	27.44	71.0	11.51	40.58	1474.
1200	2.63	34.46	1183	27.52	65.1	12.87	61.74	1480.



OFFSHORE OCEANOGRAPHY GROUP

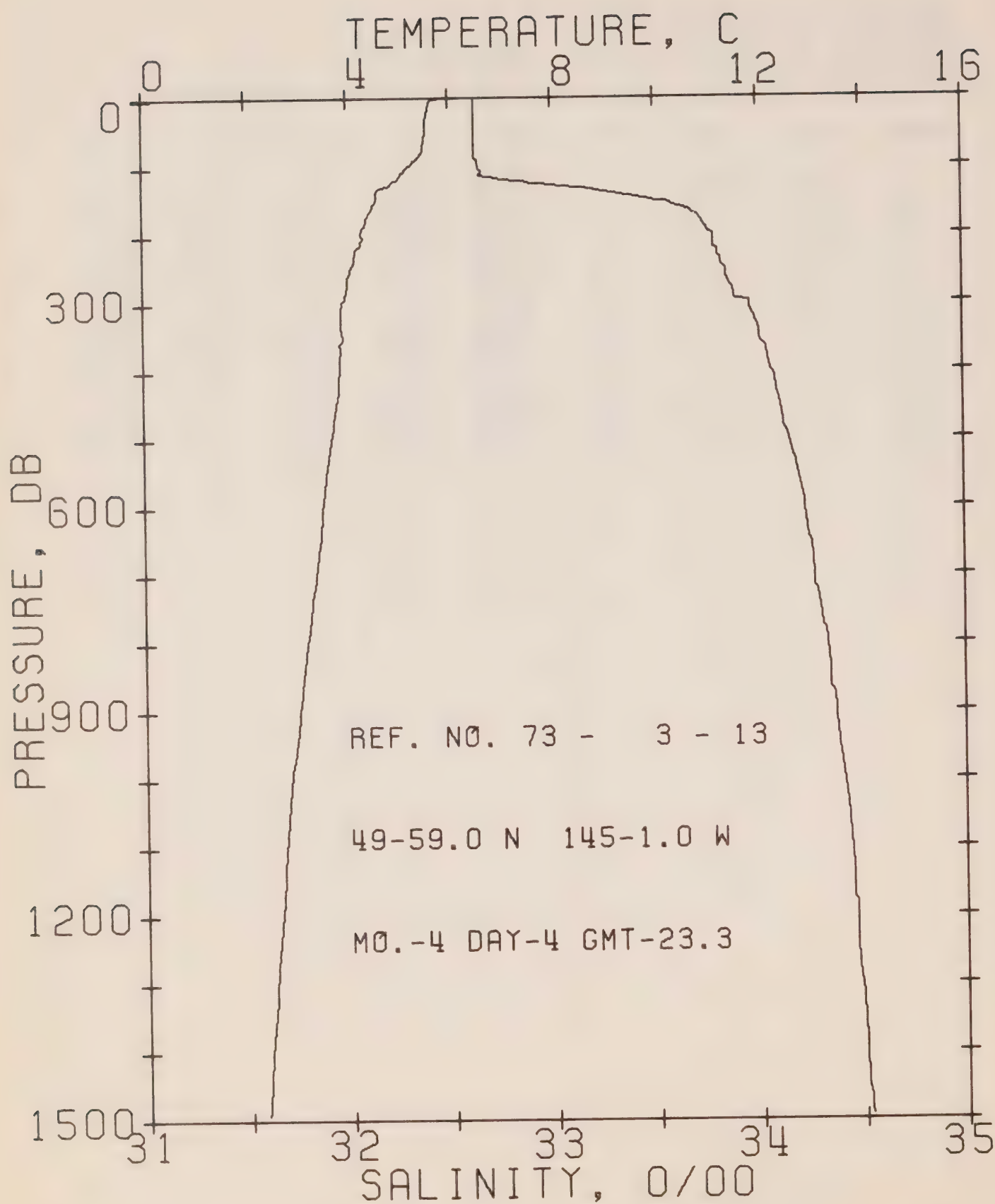
REFERENCE NO. 73- 3- 11

DATE 4/ 4/73

POSITION 49-58.0N, 145- 5.0W GMT 0.2

RESULTS OF STP CAST 108 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. FN	SOUND
0	5.41	32.64	0	25.79	222.1	0.0	0.0	1470.
10	5.41	32.64	10	25.79	222.4	0.22	0.01	1470.
20	5.41	32.64	20	25.79	222.5	0.44	0.05	1470.
30	5.41	32.64	30	25.79	222.6	0.67	0.10	1470.
50	5.40	32.64	50	25.79	222.6	1.11	0.28	1470.
75	5.39	32.64	75	25.79	222.7	1.67	0.64	1471.
100	5.24	32.64	99	25.81	221.3	2.23	1.13	1470.
125	4.57	33.27	124	26.38	166.8	2.72	1.70	1469.
150	4.48	33.62	149	26.66	140.1	3.10	2.23	1469.
175	4.46	33.74	174	26.76	131.2	3.44	2.79	1470.
200	4.30	33.78	199	26.81	126.7	3.76	3.40	1470.
225	4.15	33.81	223	26.85	123.0	4.07	4.07	1470.
250	4.05	33.84	248	26.88	120.1	4.37	4.31	1470.



OFFSHORE OCEANOGRAPHY GROUP

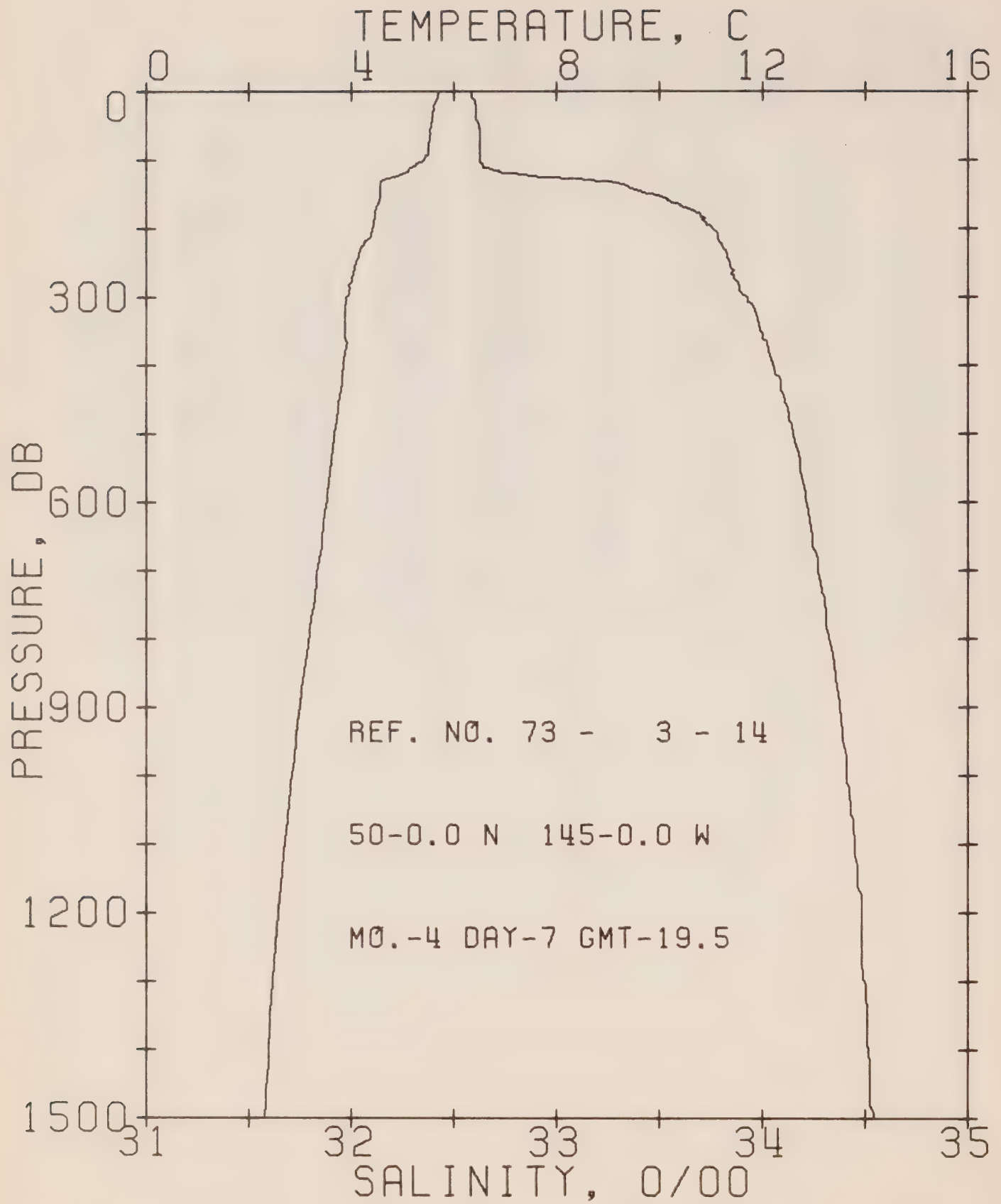
REFERENCE NO. 73- 3- 13

DATE 4/ 4/73

POSITION 49-59.0N, 145- 1.0W GMT 23.3

RESULTS OF STP CAST 177 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.05	32.63	0	25.70	230.0	0.0	0.0	1472.
10	5.61	32.63	10	25.75	225.3	0.23	0.01	1471.
20	5.58	32.63	20	25.76	225.1	0.45	0.05	1471.
30	5.56	32.63	30	25.76	224.9	0.63	0.10	1471.
50	5.55	32.63	50	25.76	225.0	1.13	0.29	1471.
75	5.49	32.63	75	25.77	224.6	1.69	0.64	1471.
100	5.25	32.65	99	25.81	220.7	2.25	1.14	1471.
125	4.96	32.90	124	26.05	197.9	2.78	1.76	1470.
150	4.57	33.48	149	26.54	151.5	3.21	2.36	1470.
175	4.33	33.71	174	26.75	132.2	3.56	2.93	1470.
200	4.27	33.79	199	26.82	125.6	3.89	3.55	1470.
225	4.16	33.81	223	26.85	123.3	4.20	4.23	1470.
250	4.06	33.84	248	26.88	120.4	4.51	4.97	1470.
300	3.89	33.96	298	27.00	109.9	5.09	6.61	1470.
400	3.83	34.06	397	27.08	102.6	6.15	10.39	1471.
500	3.67	34.15	496	27.17	95.2	7.14	14.92	1472.
600	3.48	34.22	595	27.24	88.5	8.06	20.04	1473.
800	3.16	34.33	793	27.36	78.3	9.73	31.96	1475.
1000	2.81	34.40	990	27.45	70.3	11.22	45.62	1477.
1200	2.60	34.46	1188	27.51	65.1	12.57	60.69	1480.



OFFSHORE OCEANOGRAPHY GROUP

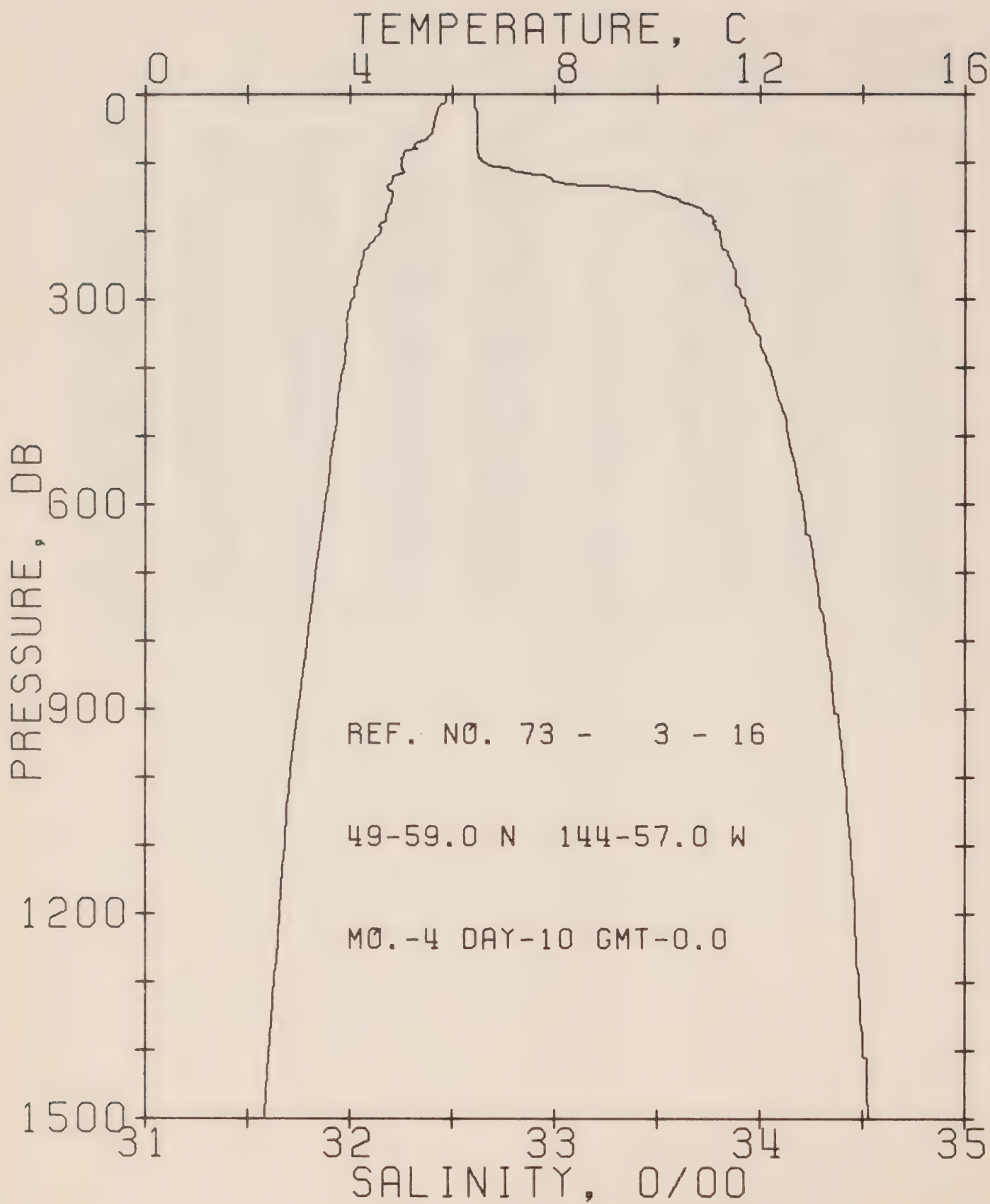
REFERENCE NO. 73- 3- 14

DATE 7/ 4/73

POSITION 50- 0.0N, 145- 0.0W GMT 19.5

RESULTS OF STD CAST 200 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.67	32.58	0	25.71	229.4	0.0	0.0	1471.
10	5.68	32.59	10	25.71	229.1	0.23	0.01	1471.
20	5.61	32.60	20	25.73	227.4	0.46	0.05	1471.
30	5.58	32.61	30	25.74	226.7	0.68	0.10	1471.
50	5.55	32.62	50	25.75	225.8	1.14	0.29	1471.
75	5.50	32.63	75	25.77	224.8	1.70	0.65	1471.
100	5.40	32.63	99	25.78	223.9	2.26	1.15	1471.
125	4.86	32.93	124	26.08	195.7	2.80	1.77	1470.
150	4.57	33.44	149	26.51	154.6	3.22	2.35	1470.
175	4.46	33.67	174	26.71	136.4	3.58	2.95	1470.
200	4.41	33.75	199	26.77	130.1	3.92	3.59	1470.
225	4.21	33.80	223	26.84	124.5	4.24	4.28	1470.
250	4.09	33.84	248	26.88	120.5	4.54	5.02	1470.
300	3.90	33.93	298	26.97	112.2	5.13	6.66	1470.
400	3.84	34.05	397	27.07	103.3	6.21	10.50	1471.
500	3.66	34.15	496	27.17	95.0	7.19	15.03	1472.
600	3.52	34.21	595	27.23	89.5	8.11	20.18	1474.
800	3.16	34.32	793	27.35	79.0	9.79	32.13	1475.
1000	2.83	34.41	990	27.45	70.0	11.27	45.64	1477.
1200	2.57	34.48	1188	27.53	63.2	12.60	60.52	1480.



OFFSHORE OCEANOGRAPHY GROUP

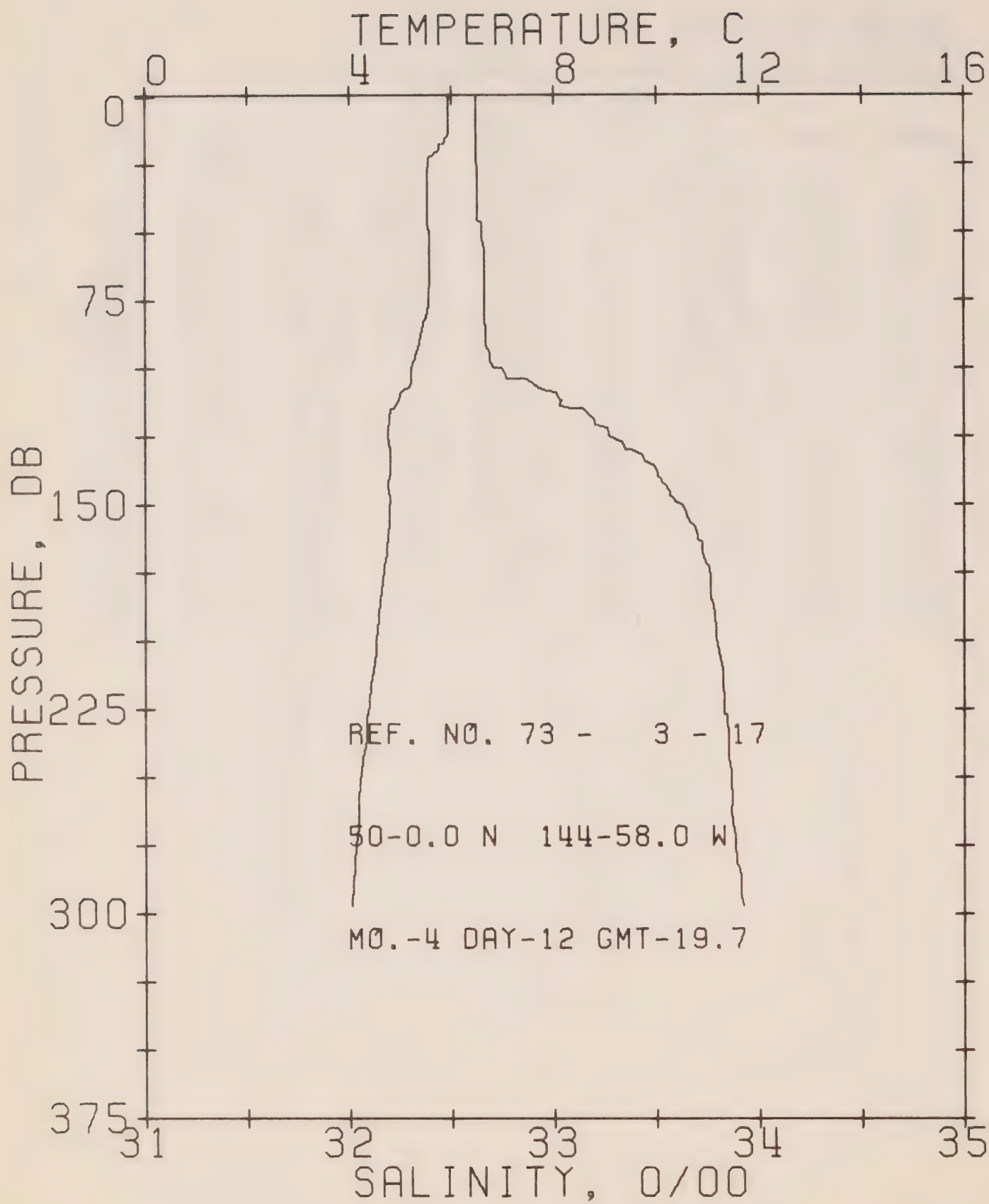
REFERENCE NO. 73- 3- 16

DATE 10/ 4/73

POSITION 49-59.0N, 144-57.0W GMT 0.0

RESULTS OF STD CAST 184 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.38	32.61	0	25.71	229.6	0.0	0.0	1471.
10	5.87	32.61	10	25.71	229.8	0.23	0.01	1472.
20	5.72	32.61	20	25.73	228.2	0.46	0.05	1471.
30	5.67	32.62	30	25.74	226.9	0.69	0.10	1471.
50	5.61	32.62	50	25.75	226.5	1.14	0.29	1471.
75	5.25	32.62	75	25.79	222.8	1.70	0.65	1470.
100	5.01	32.66	90	25.85	217.4	2.25	1.14	1470.
125	4.82	32.99	124	26.13	190.8	2.77	1.73	1470.
150	4.82	33.54	149	26.56	149.7	3.19	2.32	1471.
175	4.69	33.73	174	26.73	134.4	3.54	2.70	1471.
200	4.58	33.79	199	26.79	128.6	3.87	3.53	1471.
225	4.34	33.81	223	26.83	124.8	4.19	4.21	1470.
250	4.22	33.87	248	26.89	119.8	4.49	4.75	1470.
300	4.04	33.93	293	26.95	113.9	5.08	6.59	1470.
400	3.87	34.05	397	27.07	104.0	6.17	10.48	1472.
500	3.69	34.14	496	27.16	96.2	7.17	15.04	1473.
600	3.50	34.21	595	27.23	89.8	8.10	20.25	1473.
800	3.14	34.32	793	27.36	78.6	9.78	32.20	1475.
1000	2.82	34.41	990	27.46	70.0	11.26	45.78	1477.
1200	2.62	34.46	1188	27.51	65.2	12.61	60.85	1480.



OFFSHORE OCEANOGRAPHY GROUP

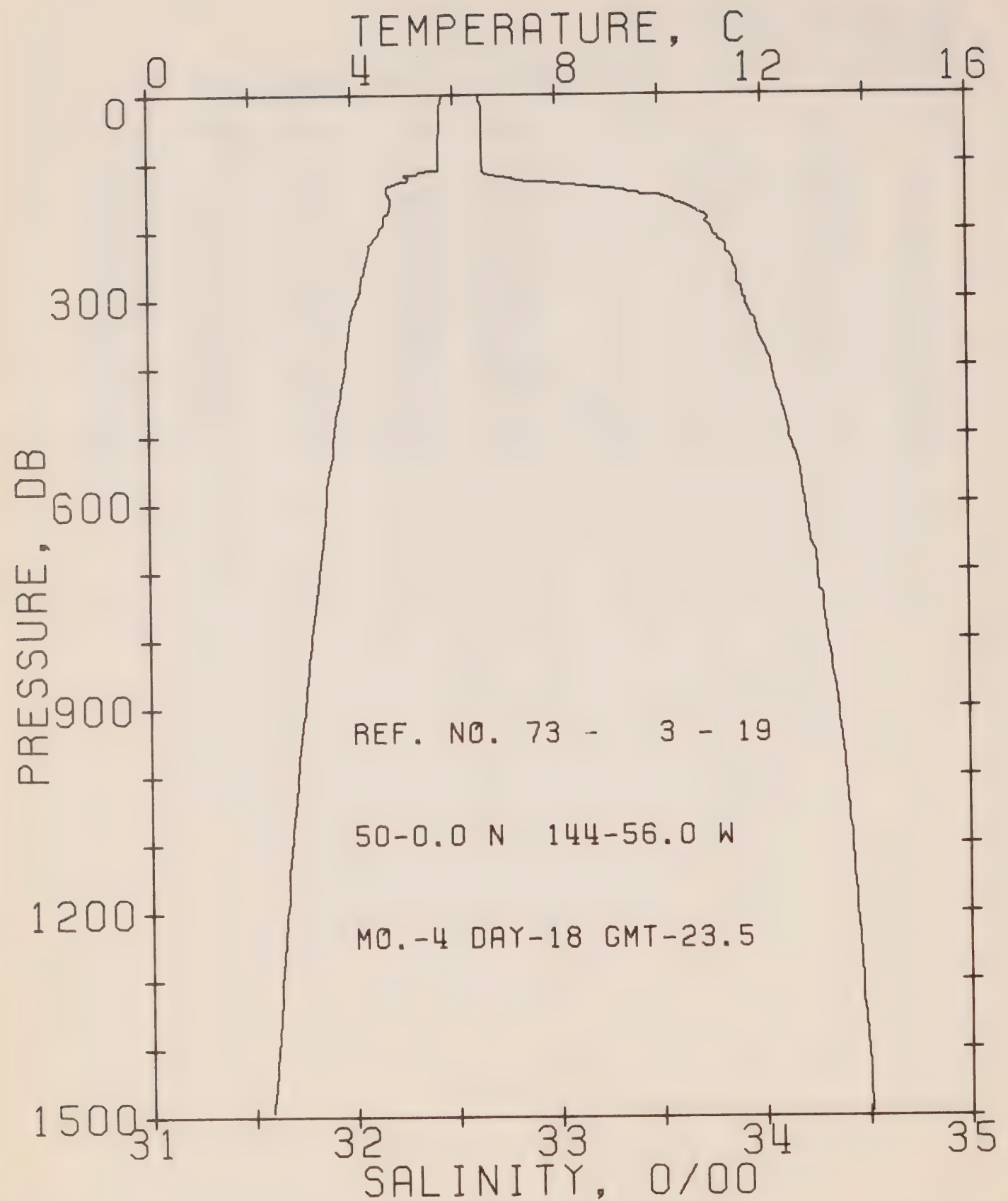
REFERENCE NO. 73- 3- 17

DATE 12/ 4/73

POSITION 50- 0.0N, 144-58.0W GMT 19.7

RESULTS OF STP CAST 115 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.93	32.62	0	25.71	229.4	0.0	0.0	1472.
10	5.95	32.62	10	25.71	230.0	0.23	0.01	1472.
20	5.75	32.62	20	25.73	227.7	0.46	0.05	1471.
30	5.52	32.63	30	25.76	224.5	0.68	0.10	1470.
50	5.56	32.65	50	25.78	223.7	1.13	0.29	1471.
75	5.55	32.66	75	25.78	223.0	1.69	0.64	1471.
100	5.19	32.71	99	25.87	215.5	2.24	1.13	1470.
125	4.75	33.27	124	26.36	169.0	2.71	1.67	1470.
150	4.78	33.62	149	26.63	143.3	3.10	2.21	1471.
175	4.65	33.75	174	26.75	132.1	3.44	2.78	1471.
200	4.51	33.79	199	26.80	128.0	3.77	3.40	1471.
225	4.35	33.93	223	26.84	123.7	4.08	4.08	1470.
250	4.20	33.86	248	26.88	120.2	4.39	4.82	1470.



OFFSHORE OCEANOGRAPHY GROUP

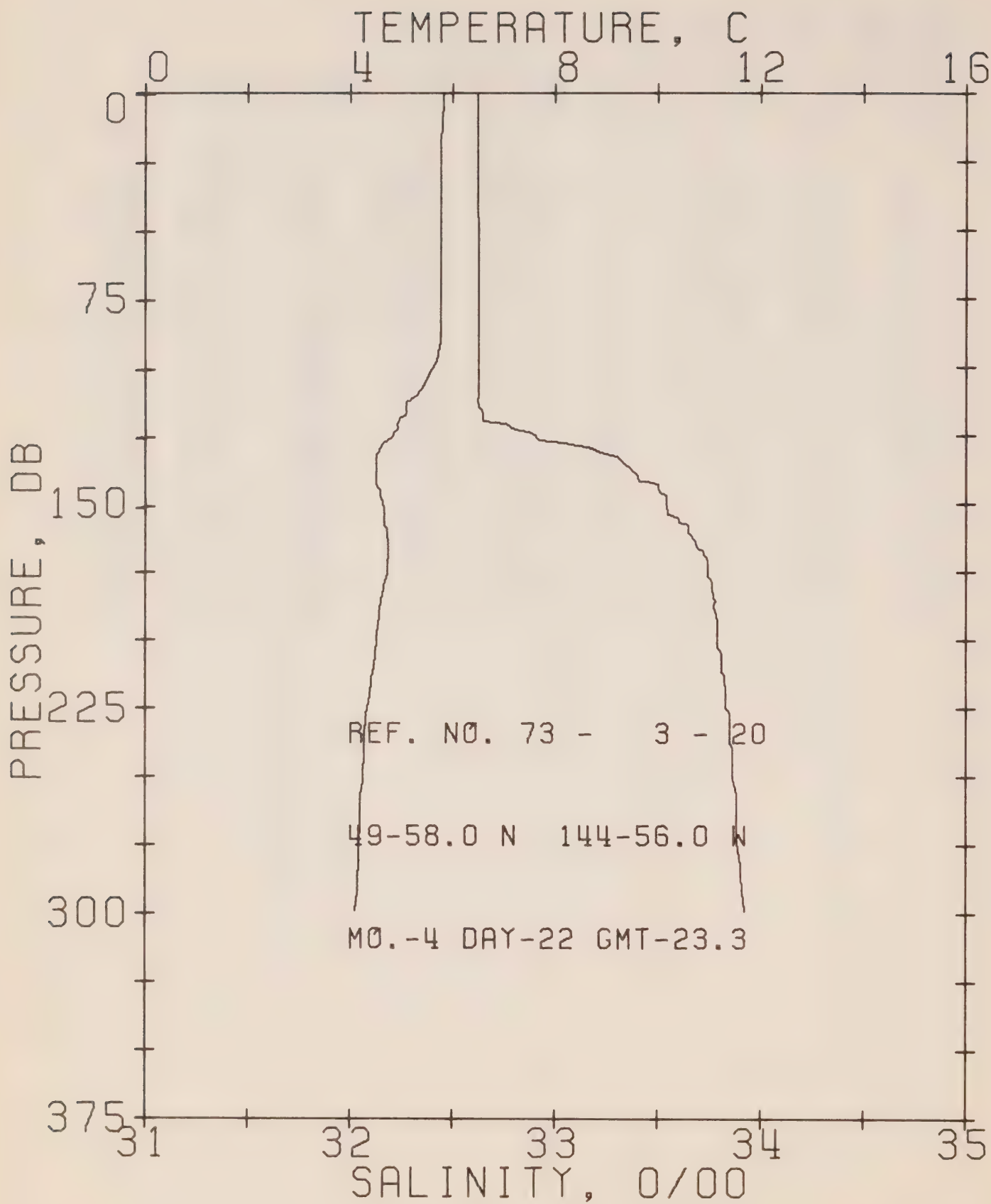
REFERENCE NO. 73- 3- 19

DATE 18/ 4/73

POSITION 50- 0.0N, 144-55.0W GMT 23.5

RESULTS OF STD CAST 159 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.78	32.63	0	25.73	226.9	0.0	0.0	1471.
10	5.77	32.63	10	25.74	227.0	0.23	0.01	1471.
20	5.74	32.64	20	25.75	226.1	0.45	0.05	1471.
30	5.74	32.64	30	25.75	226.2	0.68	0.10	1471.
50	5.73	32.64	50	25.75	226.3	1.13	0.29	1472.
75	5.72	32.64	75	25.75	226.5	1.70	0.65	1472.
100	5.72	32.64	99	25.75	226.8	2.26	1.15	1472.
125	5.13	32.92	124	25.96	206.9	2.82	1.79	1471.
150	4.76	33.52	149	26.55	150.6	3.26	2.40	1470.
175	4.68	33.71	174	26.71	135.8	3.62	3.00	1471.
200	4.55	33.76	199	26.76	131.2	3.95	3.63	1471.
225	4.34	33.83	223	26.85	123.6	4.27	4.32	1470.
250	4.27	33.86	248	26.88	120.8	4.57	5.06	1471.
300	4.08	33.92	298	26.94	114.8	5.17	6.71	1471.
400	3.84	34.05	397	27.07	103.7	6.26	10.60	1471.
500	3.62	34.13	496	27.16	95.8	7.25	15.17	1472.
600	3.46	34.20	595	27.23	89.6	8.18	20.34	1473.
800	3.16	34.31	793	27.34	79.8	9.87	32.38	1475.
1000	2.86	34.39	990	27.44	71.6	11.37	46.15	1478.
1200	2.63	34.44	1188	27.50	66.8	12.75	61.59	1480.



OFFSHORE OCEANOGRAPHY GROUP

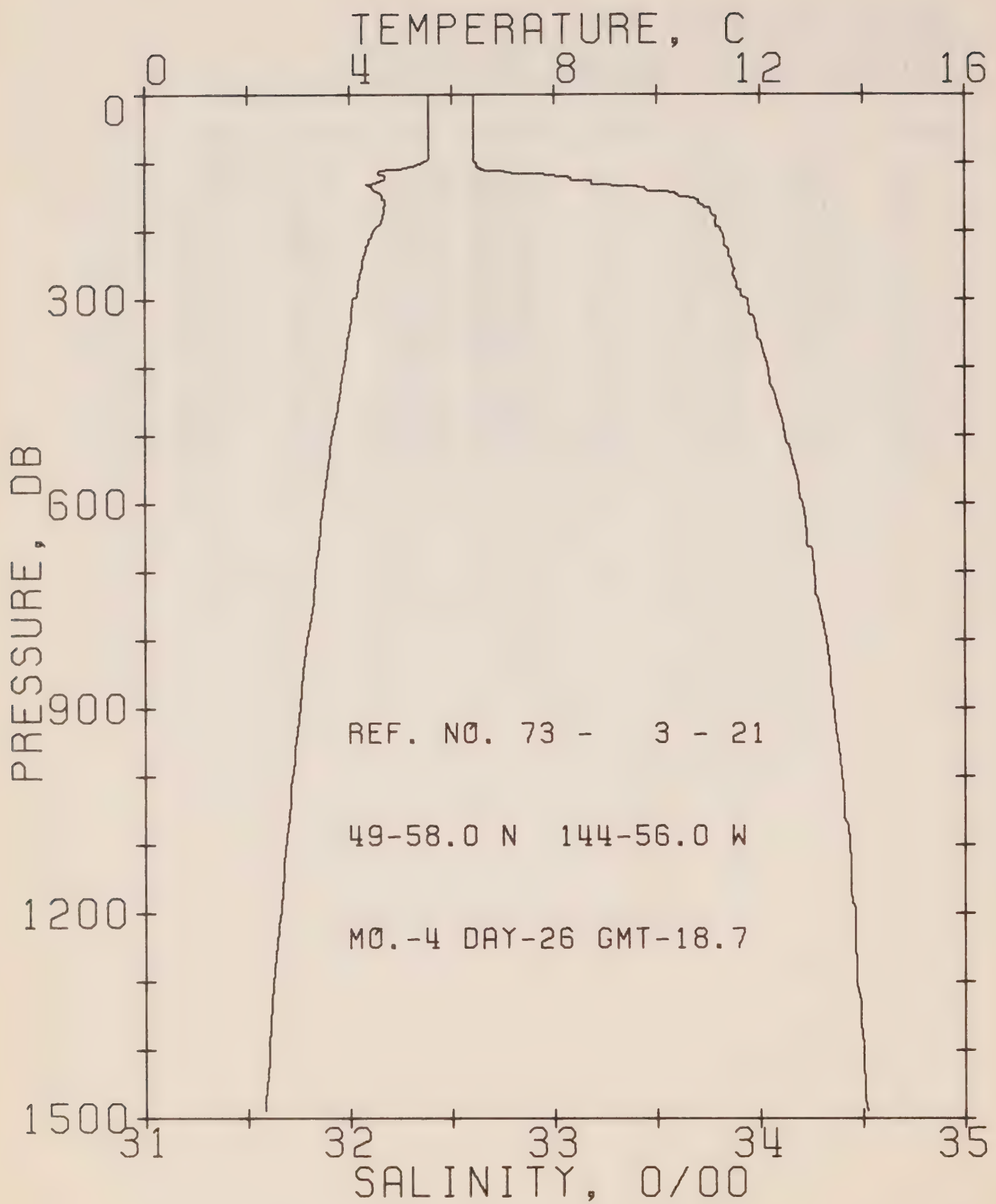
REFERENCE NO. 73- 3- 20

DATE 22/ 4/73

POSITION 49-58.0N, 144-56.0W GMT 23.3

RESULTS OF STP CAST 96 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.80	32.62	0	25.72	227.9	0.0	0.0	1471.
10	5.79	32.62	10	25.72	228.2	0.23	0.01	1471.
20	5.77	32.62	20	25.73	228.0	0.46	0.05	1471.
30	5.77	32.62	30	25.73	228.1	0.68	0.10	1471.
50	5.76	32.63	50	25.73	227.8	1.14	0.29	1472.
75	5.77	32.63	75	25.73	227.9	1.71	0.65	1472.
100	5.62	32.63	99	25.75	226.4	2.28	1.16	1472.
125	4.83	32.90	124	26.06	197.7	2.83	1.79	1470.
150	4.65	33.54	149	26.58	147.9	3.23	2.36	1470.
175	4.71	33.74	174	26.73	143.9	3.58	2.94	1471.
200	4.51	33.79	199	26.80	128.2	3.91	3.56	1471.
225	4.32	33.83	223	26.85	123.4	4.22	4.24	1470.
250	4.24	33.86	248	26.88	120.6	4.53	4.97	1470.



OFFSHORE OCEANOGRAPHY GROUP

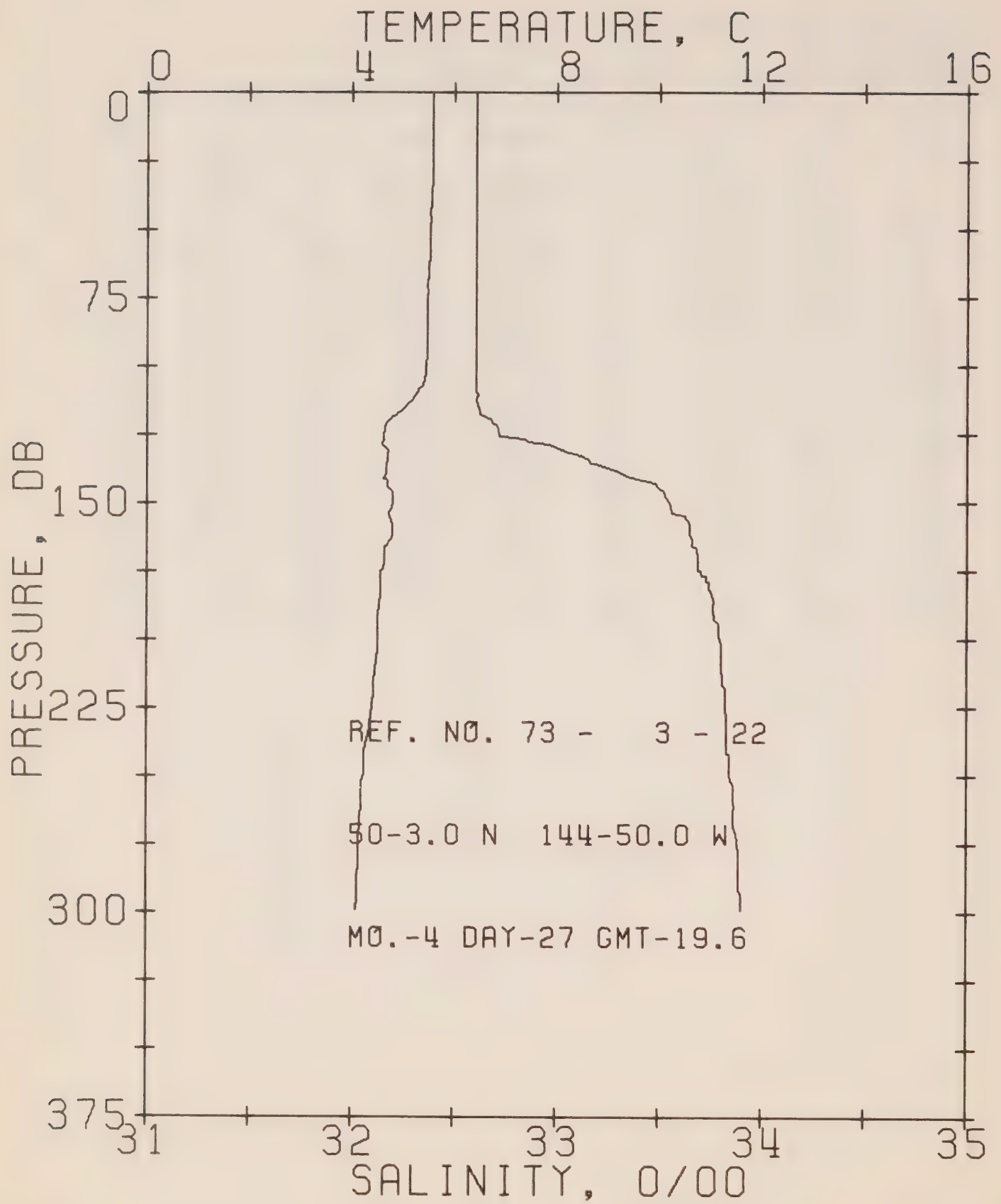
REFERENCE NO. 73- 3- 21

DATE 26/ 4/73

POSITION 49-58.0N, 144-56.0W GMT 18.7

RESULTS OF STD CAST 170 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.54	32.61	0	25.75	225.7	0.0	0.0	1470.
10	5.54	32.61	10	25.75	226.0	0.23	0.01	1470.
20	5.54	32.61	20	25.75	226.1	0.45	0.05	1470.
30	5.54	32.61	30	25.75	226.2	0.68	0.10	1471.
50	5.55	32.61	50	25.75	226.5	1.13	0.29	1471.
75	5.55	32.61	75	25.75	226.8	1.70	0.65	1471.
100	5.46	32.61	99	25.76	225.7	2.26	1.16	1471.
125	4.67	33.08	124	26.22	182.4	2.78	1.74	1469.
150	4.65	33.61	149	26.64	142.7	3.18	2.30	1470.
175	4.66	33.76	174	26.76	131.5	3.51	2.35	1471.
200	4.47	33.81	199	26.82	126.3	3.84	3.47	1470.
225	4.32	33.84	223	26.85	122.9	4.15	4.14	1470.
250	4.24	33.86	248	26.88	120.2	4.45	4.88	1470.
300	4.07	33.93	298	26.95	113.8	5.04	6.53	1471.
400	3.88	34.03	397	27.06	104.9	6.13	10.42	1472.
500	3.65	34.12	496	27.15	97.0	7.14	15.04	1472.
600	3.46	34.20	595	27.23	89.5	8.07	20.23	1473.
800	3.15	34.32	793	27.35	78.9	9.76	32.25	1475.
1000	2.86	34.40	990	27.44	71.4	11.26	46.01	1478.
1200	2.63	34.46	1183	27.51	65.3	12.63	61.31	1480.



OFFSHORE OCEANOGRAPHY GROUP

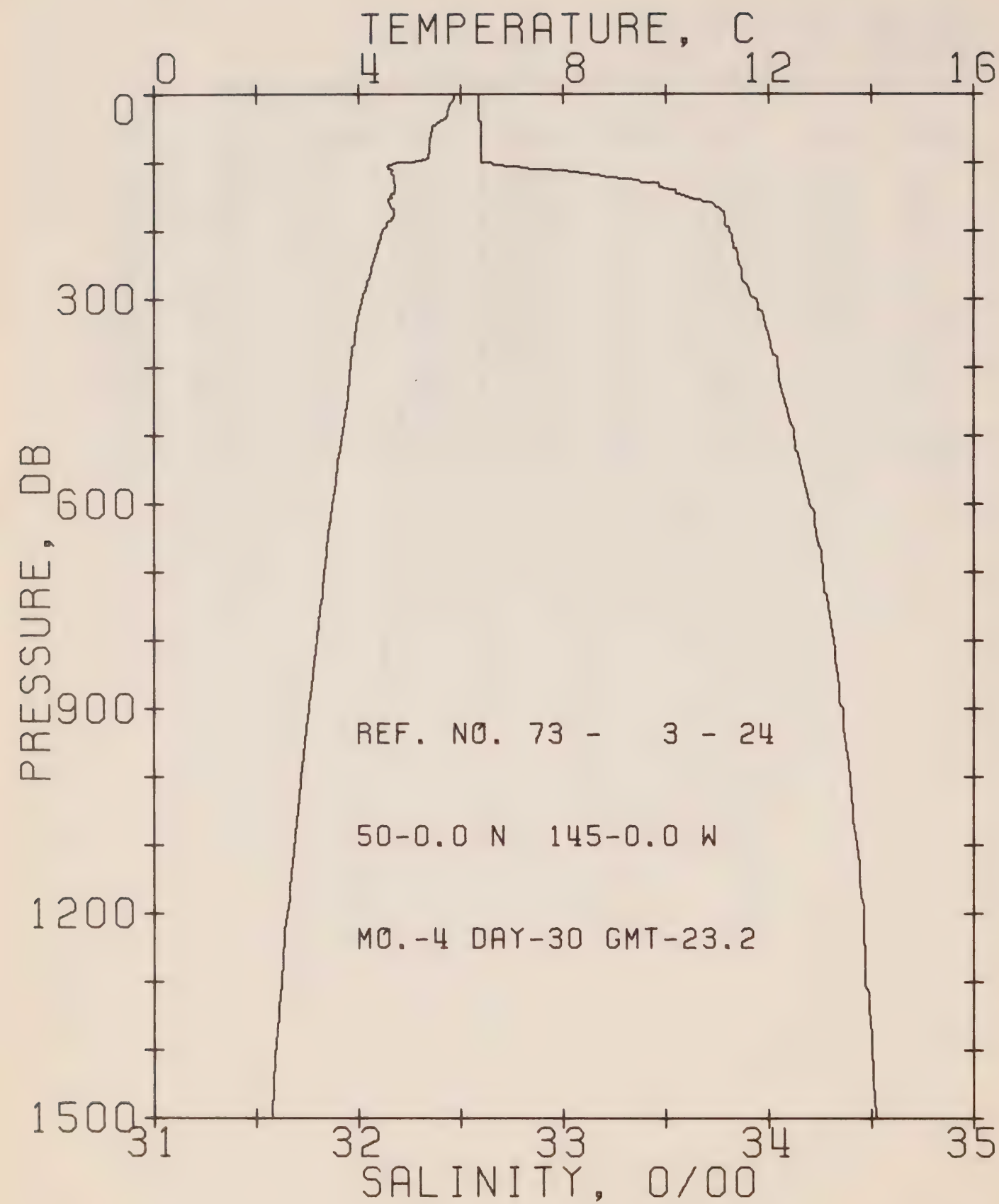
REFERENCE NO. 73- 3- 22

DATE 27/ 4/73

POSITION 50- 3.0N, 144-50.0W GMT 19.6

RESULTS OF STD CAST 131 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.56	32.61	0	25.74	225.9	0.0	0.0	1470.
10	5.57	32.61	10	25.74	226.4	0.23	0.01	1470.
20	5.58	32.61	20	25.74	226.6	0.45	0.05	1471.
30	5.56	32.61	30	25.74	226.5	0.68	0.10	1471.
50	5.53	32.61	50	25.75	226.3	1.13	0.29	1471.
75	5.47	32.61	75	25.75	225.9	1.70	0.65	1471.
100	5.44	32.61	99	25.76	225.8	2.26	1.15	1471.
125	4.62	32.72	124	25.93	209.2	2.81	1.78	1468.
150	4.81	33.55	149	26.57	148.9	3.24	2.38	1471.
175	4.57	33.69	174	26.71	136.1	3.59	2.96	1470.
200	4.50	33.79	199	26.80	127.8	3.92	3.59	1471.
225	4.39	33.82	223	26.83	124.8	4.24	4.27	1471.
250	4.21	33.84	248	26.87	121.7	4.54	5.02	1470.



OFFSHORE OCEANOGRAPHY GROUP

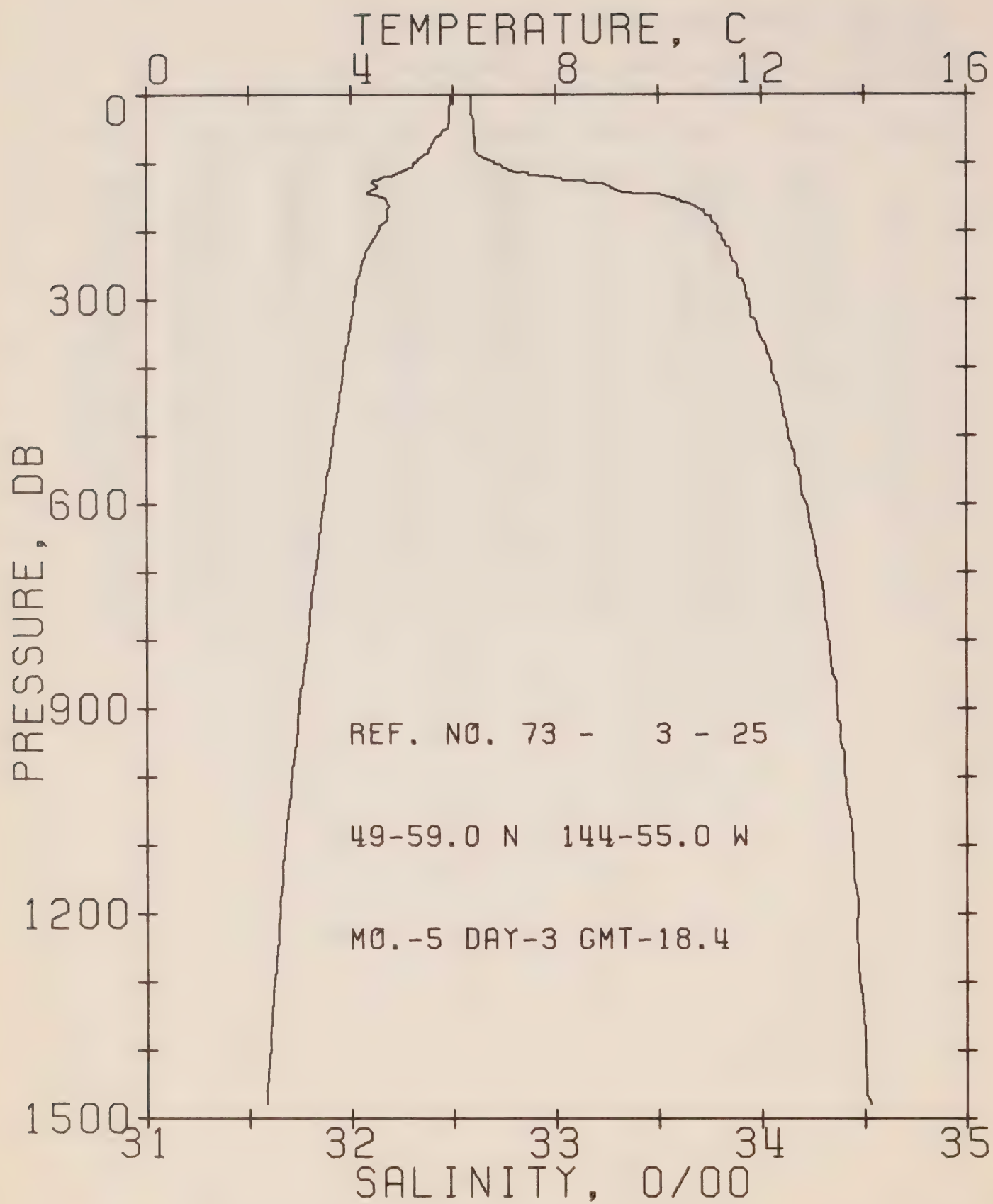
REFERENCE NO. 73- 3- 24

DATE 30/ 4/73

POSITION 50- 0.0N, 145- 0.0W GMT 23.2

RESULTS OF STP CAST 170 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.88	32.59	0	25.69	231.0	0.0	0.0	1471.
10	5.83	32.59	10	25.70	230.8	0.23	0.01	1471.
20	5.76	32.59	20	25.70	230.2	0.46	0.05	1471.
30	5.73	32.59	30	25.71	229.9	0.69	0.11	1471.
50	5.43	32.60	50	25.75	226.0	1.15	0.29	1470.
75	5.39	32.60	75	25.76	225.8	1.71	0.65	1471.
100	5.01	32.60	99	25.80	221.8	2.28	1.15	1469.
125	4.68	33.34	124	26.42	163.1	2.75	1.70	1470.
150	4.62	33.60	149	26.63	143.2	3.13	2.23	1470.
175	4.69	33.78	174	26.77	130.5	3.47	2.79	1471.
200	4.47	33.91	199	26.82	126.3	3.79	3.40	1470.
225	4.36	33.83	223	26.84	123.8	4.11	4.08	1470.
250	4.26	33.86	243	26.87	121.1	4.41	4.82	1471.
300	4.06	33.93	293	26.96	113.6	5.00	6.47	1471.
400	3.83	34.04	397	27.07	103.8	6.08	10.32	1471.
500	3.67	34.12	496	27.15	96.9	7.09	14.94	1472.
600	3.47	34.20	595	27.22	90.1	8.03	20.19	1473.
800	3.16	34.31	793	27.35	79.5	9.72	32.20	1475.
1000	2.87	34.39	990	27.44	71.6	11.23	46.07	1478.
1200	2.59	34.46	1188	27.52	64.8	12.60	61.38	1480.



OFFSHORE OCEANOGRAPHY GROUP

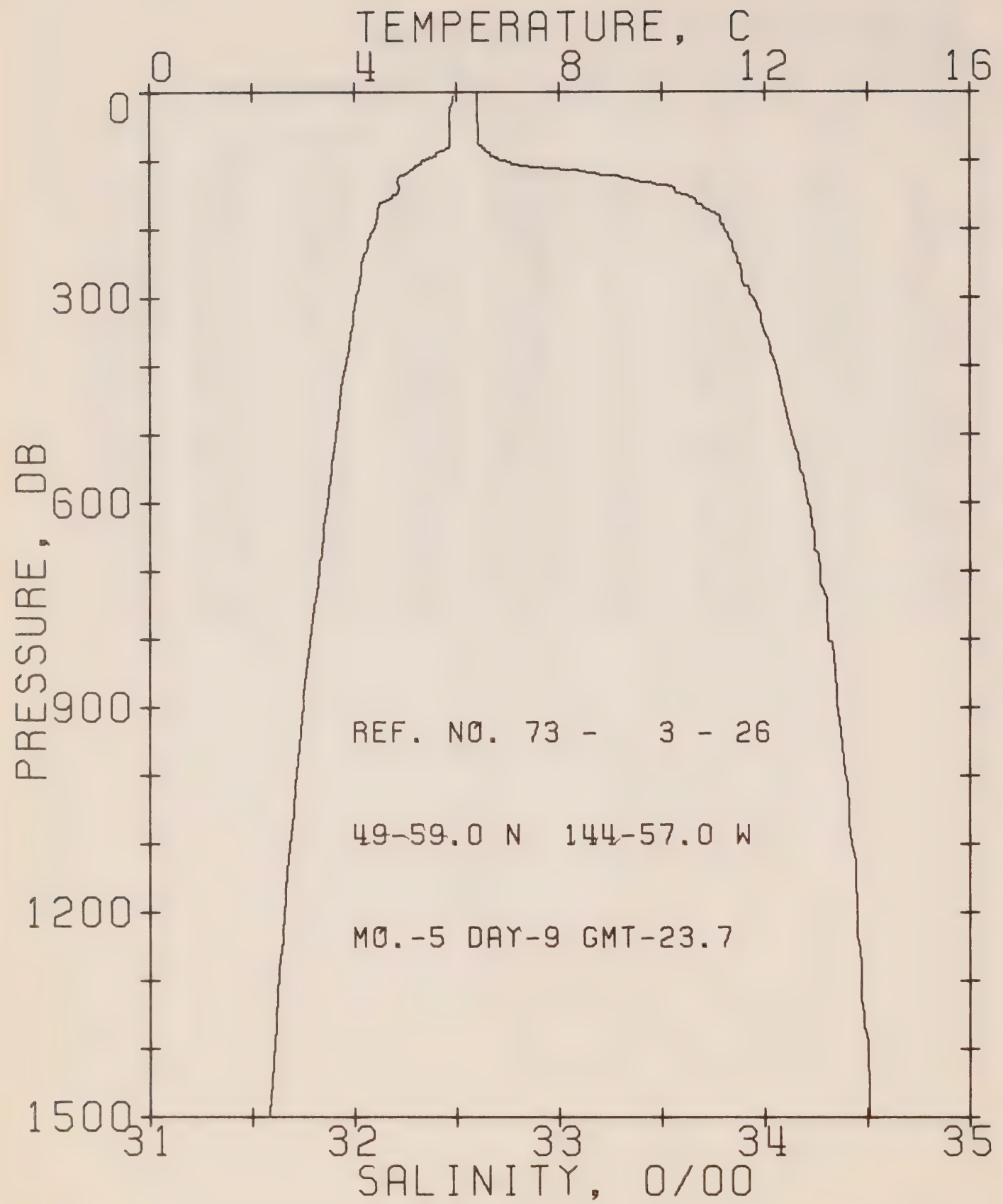
REFERENCE NO. 73- 3- 25

DATE 3/ 5/73

POSITION 49-52.0N, 144-55.0W GMT 18.4

RESULTS OF STP CAST 199 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	PDT. EN	SOUND
0	5.36	32.59	0	25.68	232.0	0.0	0.0	1472.
10	5.35	32.59	10	25.68	232.2	0.23	0.01	1472.
20	5.92	32.59	20	25.68	232.0	0.46	0.05	1472.
30	5.92	32.59	30	25.69	231.9	0.70	0.11	1472.
50	5.39	32.60	50	25.70	231.2	1.16	0.30	1472.
75	5.56	32.61	75	25.74	227.0	1.73	0.66	1471.
100	5.27	32.70	99	25.85	217.2	2.29	1.16	1471.
125	4.51	33.03	124	26.20	184.2	2.80	1.74	1468.
150	4.58	33.55	149	26.60	146.4	3.22	2.32	1470.
175	4.72	33.72	174	26.72	135.1	3.57	2.90	1471.
200	4.53	33.79	199	26.79	128.5	3.89	3.53	1471.
225	4.33	33.84	223	26.86	122.6	4.21	4.21	1470.
250	4.20	33.88	248	26.90	118.8	4.51	4.94	1470.
300	4.04	33.93	298	26.96	113.3	5.09	6.56	1471.
400	3.34	34.05	397	27.07	103.4	6.13	10.43	1471.
500	3.65	34.13	496	27.15	96.3	7.17	14.99	1472.
600	3.45	34.22	595	27.24	88.5	8.10	20.16	1473.
800	3.13	34.32	793	27.36	78.4	9.76	31.96	1475.
1000	2.92	34.40	990	27.45	70.4	11.24	45.55	1477.
1200	2.59	34.47	1188	27.52	64.4	12.58	60.55	1480.



OFFSHORE OCEANOGRAPHY GROUP

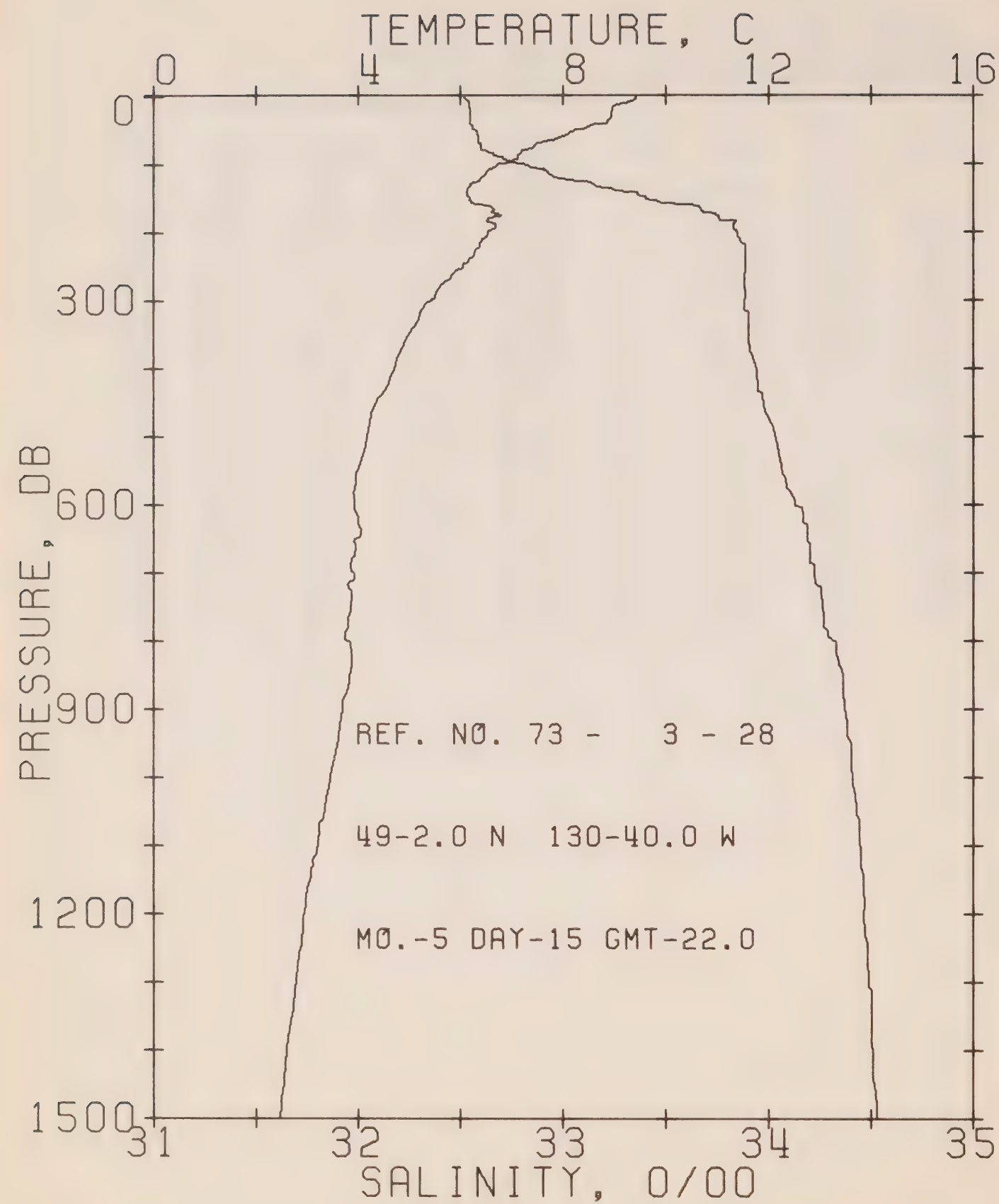
REFERENCE NO. 73- 3- 26

DATE 9/ 5/73

POSITION 49-59.0N, 144-57.0W GMT 23.7

RESULTS OF STP CAST 164 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.95	32.60	0	25.69	231.1	0.0	0.0	1472.
10	5.92	32.60	10	25.69	231.1	0.23	0.01	1472.
20	5.89	32.60	20	25.70	230.9	0.46	0.05	1472.
30	5.88	32.60	30	25.70	230.9	0.69	0.11	1472.
50	5.88	32.61	50	25.70	230.6	1.15	0.29	1472.
75	5.87	32.61	75	25.71	230.5	1.73	0.66	1473.
100	5.41	32.71	99	25.84	217.6	2.29	1.16	1471.
125	4.86	33.31	124	26.38	167.2	2.78	1.72	1470.
150	4.80	33.60	149	26.61	145.0	3.17	2.26	1471.
175	4.46	33.74	174	26.76	131.2	3.51	2.83	1470.
200	4.38	33.80	199	26.82	126.0	3.83	3.44	1470.
225	4.26	33.84	223	26.86	122.1	4.14	4.11	1470.
250	4.13	33.87	248	26.90	118.7	4.44	4.83	1470.
300	4.02	33.94	298	26.96	112.9	5.02	6.46	1470.
400	3.82	34.05	397	27.08	103.0	6.10	10.30	1471.
500	3.64	34.13	496	27.16	96.1	7.09	14.85	1472.
600	3.46	34.21	595	27.23	89.2	8.02	20.02	1473.
800	3.13	34.31	793	27.35	79.5	9.69	31.95	1475.
1000	2.35	34.39	990	27.44	71.7	11.19	45.69	1478.
1200	2.62	34.45	1188	27.50	66.1	12.56	61.04	1480.



OFFSHORE OCEANOGRAPHY GROUP

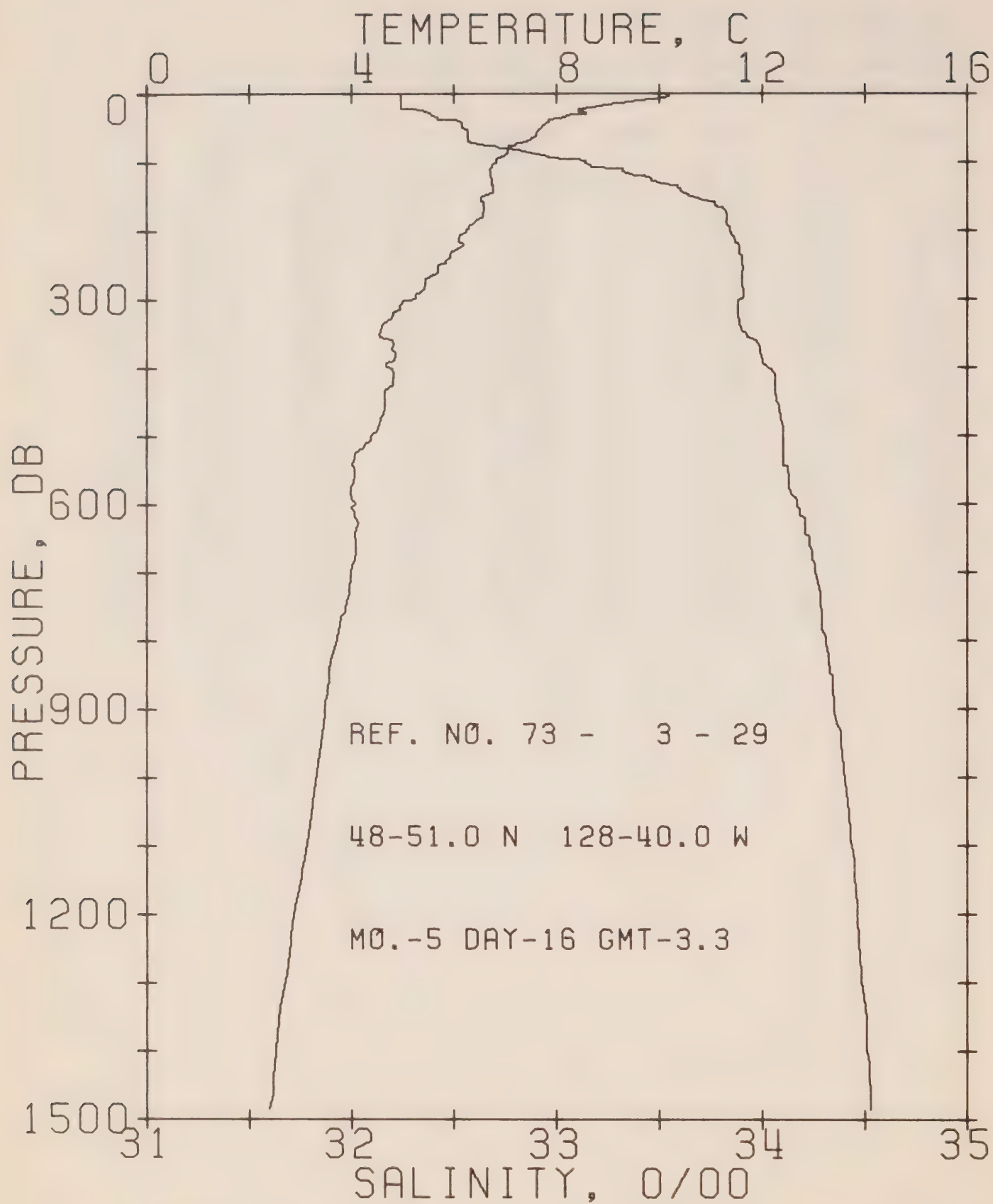
REFERENCE NO. 73- 3- 28

DATE 15/ 5/73

POSITION 49- 2.0N, 130-40.0W GMT 22.0

RESULTS OF STP CAST 267 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	9.40	32.52	0	25.14	283.4	0.0	0.0	1485.
10	9.33	32.54	10	25.17	281.3	0.28	0.01	1485.
20	8.96	32.54	20	25.23	275.6	0.56	0.06	1484.
30	8.93	32.55	30	25.24	274.8	0.84	0.13	1484.
50	8.38	32.56	50	25.33	266.5	1.38	0.35	1482.
75	7.44	32.60	75	25.49	250.9	2.02	0.76	1479.
100	6.82	32.78	99	25.72	229.7	2.63	1.30	1477.
125	6.36	33.07	124	26.01	202.6	3.17	1.92	1476.
150	6.19	33.40	149	26.29	176.1	3.64	2.57	1476.
175	6.80	33.74	174	26.48	158.9	4.06	3.26	1479.
200	6.54	33.34	199	26.59	148.4	4.44	3.99	1479.
225	6.33	33.39	223	26.66	142.4	4.80	4.77	1479.
250	6.05	33.39	243	26.69	139.2	5.15	5.63	1478.
300	5.45	33.88	298	26.76	132.8	5.83	7.53	1476.
400	4.70	33.94	397	26.89	121.1	7.10	12.03	1475.
500	4.17	34.03	496	27.02	109.3	8.25	17.31	1474.
600	3.93	34.13	595	27.13	100.0	9.30	23.18	1475.
800	3.79	34.32	793	27.29	85.9	11.16	36.46	1478.
1000	3.44	34.41	991	27.40	76.9	12.80	51.44	1480.
1200	2.92	34.46	1188	27.49	68.3	14.24	67.59	1481.



OFFSHORE OCEANOGRAPHY GROUP

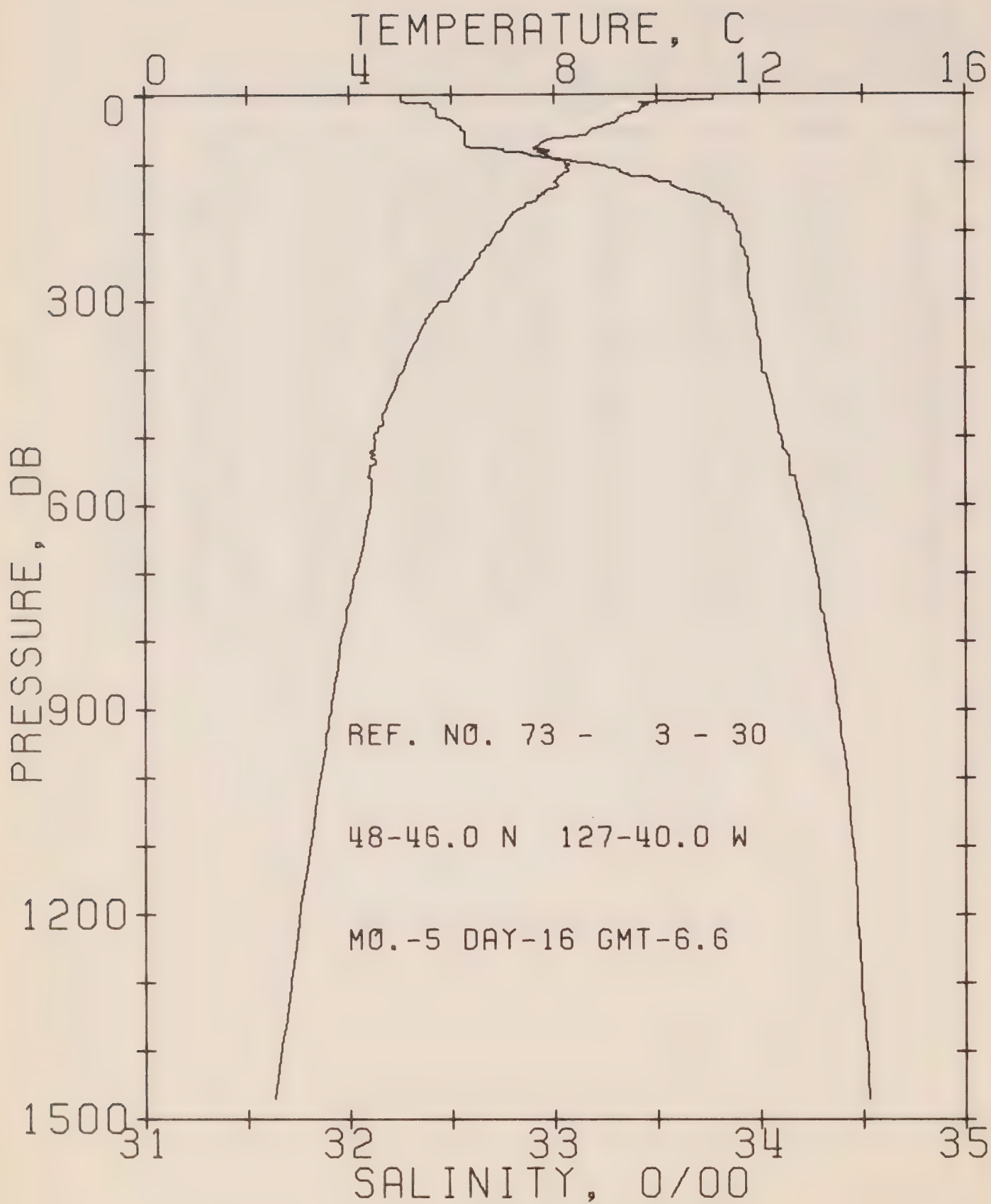
REFERENCE NO. 73- 3- 29

DATE 16/ 5/73

POSITION 48-51.0N, 128-40.0W GMT 3.3

RESULTS OF STD CAST 273 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.15	32.24	0	24.80	315.9	0.0	0.0	1487.
10	9.69	32.24	10	24.88	309.0	0.31	0.02	1486.
20	8.67	32.24	20	25.03	294.0	0.62	0.06	1482.
30	8.57	32.39	30	25.17	281.5	0.90	0.13	1482.
50	7.67	32.54	50	25.42	258.1	1.43	0.35	1479.
75	7.19	32.65	75	25.57	243.9	2.07	0.75	1478.
100	6.82	33.14	99	26.00	202.9	2.63	1.25	1478.
125	6.74	33.46	124	26.27	178.3	3.10	1.80	1478.
150	6.59	33.64	149	26.43	163.3	3.53	2.39	1478.
175	6.57	33.83	174	26.58	149.3	3.92	3.03	1479.
200	6.25	33.84	199	26.63	144.7	4.28	3.74	1478.
225	6.11	33.89	223	26.69	139.6	4.64	4.50	1478.
250	5.73	33.90	248	26.74	134.5	4.98	5.33	1477.
300	5.21	33.89	298	26.80	129.3	5.64	7.18	1475.
400	4.69	34.03	397	26.96	114.4	6.86	11.51	1475.
500	4.38	34.10	496	27.06	106.3	7.97	16.59	1475.
600	4.06	34.17	595	27.15	98.5	8.99	22.30	1476.
800	3.69	34.31	793	27.29	85.6	10.83	35.42	1478.
1000	3.30	34.40	991	27.40	76.2	12.44	50.17	1479.
1200	2.87	34.46	1188	27.49	68.0	13.88	66.25	1481.



OFFSHORE OCEANOGRAPHY GROUP

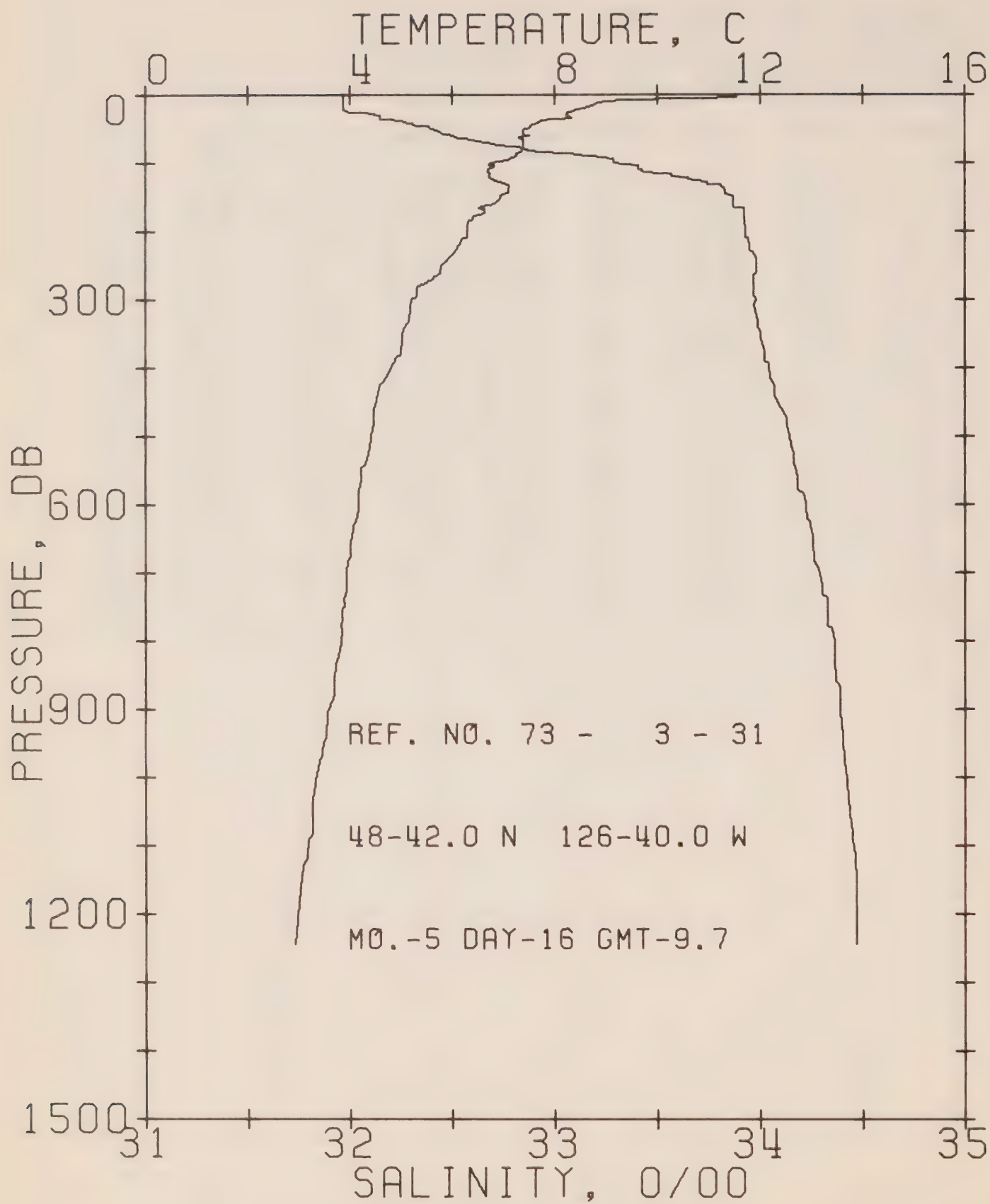
REFERENCE NO. 73- 3- 30

DATE 16/ 5/73

POSITION 48-46.0N, 127-40.0W GMT 6.6

RESULTS OF STP CAST 235 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.10	32.25	0	24.64	330.7	0.0	0.0	1491.
10	10.38	32.25	10	24.77	319.3	0.33	0.02	1489.
20	9.69	32.43	20	25.02	295.1	0.63	0.06	1486.
30	9.38	32.43	30	25.07	290.5	0.93	0.14	1485.
50	8.84	32.55	50	25.25	273.9	1.49	0.37	1484.
75	7.68	32.57	75	25.44	256.1	2.15	0.79	1480.
100	8.20	33.14	99	25.81	221.6	2.75	1.32	1483.
125	8.02	33.49	124	26.11	193.4	3.27	1.71	1483.
150	7.70	33.73	149	26.34	171.5	3.73	2.55	1483.
175	7.18	33.85	174	26.51	155.8	4.13	3.23	1481.
200	6.94	33.89	199	26.58	150.0	4.51	3.95	1481.
225	6.65	33.92	223	26.64	144.5	4.88	4.75	1480.
250	6.43	33.94	248	26.68	140.3	5.24	5.61	1479.
300	5.93	33.95	298	26.76	133.5	5.92	7.53	1478.
400	5.06	34.01	397	26.91	120.0	7.17	11.98	1476.
500	4.49	34.10	496	27.04	107.8	8.31	17.17	1476.
600	4.41	34.20	595	27.13	100.5	9.34	22.09	1477.
800	3.81	34.32	793	27.29	86.0	11.20	36.18	1478.
1000	3.40	34.42	991	27.41	75.6	12.81	50.96	1480.
1200	3.00	34.47	1188	27.49	68.8	14.26	67.08	1482.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 3- 31

DATE 16/ 5/73

POSITION 48-42.0N, 126-40.0W GMT 9.7

RESULTS OF STD CAST 234 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.51	31.97	0	24.35	358.4	0.0	0.0	1492.
10	9.18	31.97	10	24.75	321.3	0.35	0.02	1484.
20	8.55	31.97	20	24.84	312.3	0.66	0.07	1481.
30	8.22	32.12	30	25.01	296.6	0.97	0.14	1431.
50	7.46	32.40	50	25.33	265.9	1.53	0.37	1478.
75	7.38	32.79	75	25.65	235.9	2.17	0.78	1479.
100	6.84	33.29	99	26.12	192.0	2.70	1.25	1478.
125	6.84	33.68	124	26.43	163.2	3.15	1.76	1479.
150	6.92	33.87	149	26.56	150.5	3.54	2.31	1480.
175	6.58	33.92	174	26.65	142.7	3.91	2.91	1479.
200	6.30	33.93	199	26.69	138.7	4.26	3.58	1478.
225	6.08	33.95	223	26.74	134.7	4.60	4.32	1478.
250	5.79	33.98	248	26.80	129.2	4.93	5.12	1477.
300	5.20	33.98	298	26.87	122.8	5.56	6.00	1475.
400	4.80	34.04	397	26.96	114.7	6.76	11.17	1475.
500	4.40	34.14	496	27.08	103.8	7.85	16.13	1476.
600	4.15	34.22	595	27.17	95.8	8.85	21.73	1476.
800	3.82	34.36	793	27.32	83.4	10.64	34.47	1473.
1000	3.33	34.42	990	27.41	75.0	12.22	48.99	1480.
1200	2.95	34.47	1188	27.49	68.2	13.65	64.34	1481.

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 3- 32

DATE 16/ 5/73

POSITION 48-38.0N, 125- 0.0W GMT 12.2

RESULTS OF STP CAST 66 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.51	31.82	0	24.24	369.5	0.0	0.0	1492.
10	10.59	31.86	10	24.43	351.5	0.37	0.02	1489.
20	9.25	32.03	20	24.78	317.8	0.70	0.07	1484.
30	8.26	32.28	30	25.13	285.3	1.00	0.15	1481.
50	7.54	32.97	50	25.77	224.3	1.50	0.35	1479.
75	7.51	33.46	75	26.16	187.8	2.02	0.68	1480.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	11.51	31.82	52.	7.61	33.00
5.	11.51	31.82	53.	7.66	33.04
6.	11.46	31.83	55.	7.73	33.04
7.	11.11	31.83	57.	7.73	33.12
9.	10.85	31.86	58.	7.73	33.15
10.	10.59	31.86	58.	7.71	33.15
11.	10.31	31.86	61.	7.67	33.17
13.	9.82	31.90	62.	7.67	33.22
15.	9.80	31.91	63.	7.67	33.26
16.	9.63	31.93	65.	7.67	33.27
18.	9.41	31.94	65.	7.67	33.29
19.	9.26	32.02	68.	7.64	33.32
21.	9.25	32.05	70.	7.62	33.34
22.	9.13	32.12	71.	7.60	33.36
23.	9.01	32.12	73.	7.56	33.41
25.	8.97	32.12	74.	7.54	33.43
26.	8.67	32.22	75.	7.51	33.46
29.	8.55	32.22	77.	7.46	33.50
30.	8.26	32.28	79.	7.37	33.52
31.	8.05	32.39	79.	7.36	33.54
33.	8.00	32.44	80.	7.28	33.54
36.	7.97	32.52	81.	7.26	33.58
38.	7.87	32.60	82.	7.17	33.59
39.	7.84	32.65	83.	7.12	33.65
40.	7.83	32.66	84.	7.07	33.65
41.	7.83	32.68	85.	7.04	33.72
42.	7.79	32.69	87.	7.02	33.72
43.	7.67	32.72	88.	7.00	33.74
45.	7.46	32.79	89.	6.99	33.75
48.	7.47	32.90	90.	6.98	33.75
49.	7.48	32.96	94.	6.96	33.76
50.	7.54	32.97	95.	6.95	33.77
51.	7.57	33.00	98.	6.93	33.79

SURFACE TEMPERATURE AND SALINITY OBSERVATIONS

(P-73-3)

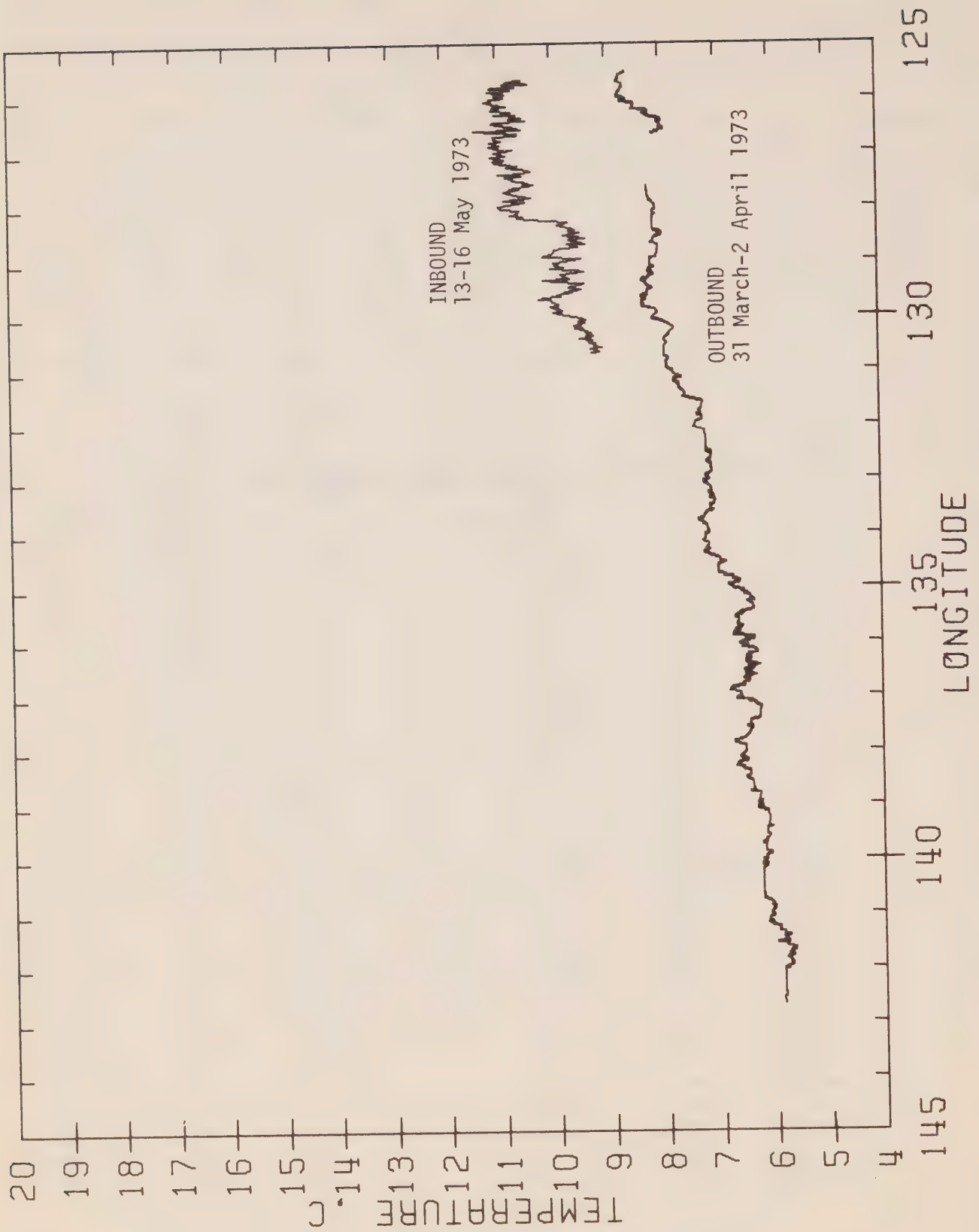


Figure 14 Surface temperature along Line P recorded from engine room intake. P-73-3

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 3

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GMT	0/00	C	WEST
73	3	31	100	31.440	8.6	125-33
73	3	31	320	30.995	8.7	126- 0
73	3	31	630	32.420	8.0	126-40
73	3	31	1010	32.529	8.3	127-40
73	3	31	1400	31.864	8.2	128-40
73	3	31	1800	31.826	8.3	129-40
73	3	31	2120	32.564	7.9	130-40
73	4	1	120	32.528	7.3	131-40
73	4	1	430	32.515	7.1	132-40
73	4	1	740	32.671		133-40
73	4	1	1110	32.497	7.0	134-40
73	4	1	1440	32.445	6.0	135-40
73	4	1	1800	32.458	6.5	136-40
73	4	1	2005	32.539	6.5	137-40
73	4	2	100	32.563	6.2	139-40
73	4	2	400	32.576	6.2	140-40
73	4	2	800	32.600	5.7	141-40
73	4	2	1100	32.587	5.9	142-40
73	4	2	0	32.511		143-40
73	4	3	0	32.600	5.8	ON STATION
73	4	4	0	32.623	5.5	ON STATION
73	4	5	0	32.617		ON STATION
73	4	6	0	32.613	5.6	ON STATION
73	4	7	0	32.601	5.7	ON STATION
73	4	8	0	32.592	5.8	ON STATION
73	4	9	0	32.605	5.9	ON STATION
73	4	10	0	32.606	6.0	ON STATION
73	4	11	0	32.605	6.2	ON STATION
73	4	12	0	32.603	6.3	ON STATION
73	4	13	0	32.641	6.0	ON STATION
73	4	14	0	32.617	6.0	ON STATION
73	4	15	0	32.632	6.0	ON STATION
73	4	16	0	32.642	6.0	ON STATION
73	4	17	0	32.648	5.8	ON STATION
73	4	18	0	32.659	5.9	ON STATION
73	4	19	0	32.643	5.9	ON STATION
73	4	20	0	32.632	6.0	ON STATION
73	4	21	0	32.648	6.1	ON STATION
73	4	22	0	32.616	5.9	ON STATION
73	4	23	0	32.619		ON STATION
73	4	24	0	32.612	6.1	ON STATION
73	4	25	0	32.575	5.6	ON STATION
73	4	26	0	32.588		ON STATION
73	4	27	0	32.643	5.9	ON STATION
73	4	28	0	32.598	5.6	ON STATION

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 3

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GMT	0/00	C	WEST
73	4	23	0	32.598	5.6	ON STATION
73	4	29	0	32.592	5.8	ON STATION
73	4	30	0	32.601	6.0	ON STATION
73	5	1	0	32.604	5.9	ON STATION
73	5	2	0	32.594	6.0	ON STATION
73	5	3	0	32.612	6.0	ON STATION
73	5	4	0	32.602	6.0	ON STATION
73	5	5	0	32.617	5.9	ON STATION
73	5	6	0	32.601	6.1	ON STATION
73	5	7	0	32.596	5.9	ON STATION
73	5	8	0	32.591	6.0	ON STATION
73	5	9	0	32.600	6.2	ON STATION
73	5	10	0	32.597	6.0	ON STATION
73	5	11	0	32.599	6.1	ON STATION
73	5	12	0	32.593	6.1	ON STATION
73	5	13	0	32.608	6.1	ON STATION
73	5	15	2200	32.485	9.4	130-40
73	5	16	125	32.207	10.1	129-40
73	5	16	320	32.201	10.2	128-40
73	5	16	635	32.348	11.0	127-40
73	5	16	950	31.952	11.4	126-40
73	5	16	1205	31.756	11.5	126- 0

**OCEANOGRAPHIC OBSERVATIONS AT
OCEAN STATION P (50°N, 145°W)
VOLUME 57**

May 11 - September 19, 1973



**B. Minkley, C. Jackson
K. Abbott-Smith**

ENVIRONMENT CANADA
Fisheries and Marine Service
Marine Sciences Directorate
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Victoria, B.C.



MARINE SCIENCES DIRECTORATE, PACIFIC REGION

PACIFIC MARINE SCIENCE REPORT 74-4

OCEANOGRAPHIC OBSERVATIONS AT OCEAN STATION P (50°N, 145°W)

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Marine Sciences Directorate, Pacific Region
Environment Canada
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This is a manuscript which has received only limited circulation. On citing this report in a bibliography, the title should be followed by the words "UNPUBLISHED MANUSCRIPT" which is in accordance with accepted bibliographic custom.

INTRODUCTION

Canadian operation of Ocean Weather Station P (latitude 50°00'N, longitude 145°00'W) was inaugurated in December, 1950. The station is occupied primarily to make meteorological observations of the surface and upper air and to provide an air-sea rescue service. The station is manned by two vessels operated by the Marine Services Branch of the Ministry of Transport. They are the CCGS Vancouver and the CCGS Quadra. Each ship remains on station for a period of six weeks, and is then relieved by the alternate ship, thus maintaining a continuous watch.

Bathythermograph observations have been made at Station P since July, 1952. A program of more extensive oceanographic observations was commenced in August, 1956. This was further extended in April, 1959, by the addition of a series of oceanographic stations along the route to and from Station P and Swiftsure Bank. These stations are known as Line P stations. The number of stations on Line P has been increased twice and now consists of twelve stations (Fig. 1). Bathythermograph observations and surface salinity sample collections in addition to being made on Line P oceanographic stations are also made at odd meridians at 40' i.e., 139°40'W, 141°40'W, etc. These stations are known as Line P BT stations. Data observed prior to 1968 has been indexed by Collins et al, (1969).

The present record includes hydrographic and continuously sampled STD data collected from the Quadra during the period May 11 to June 27, 1973; surface temperature and salinity data collected from the Vancouver during the period June 22 to August 8, 1973; and hydrographic and continuously sampled STD data collected from the Quadra during the period August 3 to September 19, 1973.

All physical oceanographic data have been stored by the Canadian Oceanographic Data Centre (CODC), 615 Booth Street, Ottawa, Ontario, Canada. Requests for these data should be directed to CODC.

Biological and productivity data are published in the Manuscript Report series of the Fisheries Research Board of Canada (FRB), the Biological Station, Nanaimo, B.C., Canada. Requests for these data should be directed to FRB.

Marine geochemical data are for the Ocean Chemistry Group, Marine Sciences Directorate, Department of the Environment, 512-1230 Government St., Victoria, B.C., Canada.

Bird observations are sent to Dr. M. Myres, University of Calgary, Calgary, Alberta, Canada; and marine mammal observations to Mr. I. McAskie, Fisheries Research Board of Canada, the Biological Station, Nanaimo, B.C., Canada.

Program of Observations from CCGS Quadra, May 11 to June 27, 1973
(P-73-4) (CODC Ref. No. 15-73-004)

Oceanographic observations were made by Mr. B. Minkley, Marine Sciences Directorate, Department of the Environment.

En route to Station P, Stations 1 to 8 and 10 to 12 were occupied and a STD profile made to near bottom or 1500 metres. Station 9 was missed due to bad weather. Mechanical BT or XBT's were taken at all Line P hydrographic and BT stations. The surface temperature recorder and thermosalinograph were run continuously along Line P. The temperature pen ink system of the thermosalinograph recorder broke down at Station 8 leaving salinity trace only from Stations 8 to 12. Salinity and nitrate samples were taken from the seawater loop at all Line P stations. Tar ball tows were made at Stations 2, 4, 7, and 10, at a speed of 4 knots.

At Station P the oceanographic program was carried out as follows:

I) Physical Oceanography

- 1) Profiles of salinity, temperature and oxygen were obtained from 4 hydrographic stations to near bottom (4200 metres).
- 2) STD profiles to 1500 metres following the hydrographic stations.
- 3) Five STD profiles to 300 metres between the hydrographic stations.
- 4) Mechanical BT's were taken every 3 hours to coincide with meteorological observations and encoded and transmitted according to the IGOSS format.
- 5) Salinity sample daily from the seawater loop at 0000 hrs. GMT.
- 6) The wave recorder was run every 3 hours for 20 minutes to coincide with the meteorological observations.

II) Biological and Productivity

Samples were obtained as follows:

- 1) Plankton
A total of 12-150 metre, 1-1200 metre vertical plankton hauls and 4-10 minute horizontal surface tows.
- 2) Two profiles to 200 metres for plant pigment, nitrate and C-14 productivity.

III) Marine Geochemistry

Samples were obtained as follows:

- 1) Oxygen - samples were taken from all hydrographic stations.
- 2) Nutrient and salinity samples daily at 0000 hrs. GMT, plus

hourly sampling for one 24 hour period from the seawater loop.

- 3) Alkalinity samples every 3 days from the seawater loop.
- 4) Air CO₂ samples weekly in duplicate.
- 5) Two seawater C-14 samples from the seawater loop.

IV) Marine Mammal, Bird and Data for Other Institutes

- 1) Marine mammal and bird observations were recorded.
- 2) Five samples to 400 metres for seawater C-14 were taken for the University of Washington.
- 3) A deep sea tide gauge of the University of Hawaii, Joint Tsunami Research Effort, was installed at Station P on the 1st of June.
- 4) Observation of a 16 foot diameter disc buoy anchored by the University of California.

The ship left Station P on June 7 to take a sick seaman to Quatsino Sound, returned on station by June 11.

En route from Station P, all stations except Station 7 were occupied and a STD profile made to near bottom or 1500 metres. Station 7 was missed due to bad weather. Mechanical BT or XBT's were taken at all Line P hydrographic and BT stations. The surface temperature recorder and thermosalinograph recorder were run continuously along Line P. Salinity, nitrate and nutrient samples were taken from the seawater loop at all Line P stations and tar ball tows made at Stations 12, 10, and 7, at a speed of 4 knots.

Program of Observations from CCGS Vancouver, June 22 to August 8, 1973 (P-73-5) (CODC Ref. No. 15-73-005)

Oceanographic observations were made by the ship's officers.

En route to Station P, mechanical BT's were taken at all Line P hydrographic and BT stations. Salinity, nitrate and nutrient samples were taken from the seawater loop.

At Station P the oceanographic program was carried out as follows:

I) Physical Oceanography

- 1) Mechanical BT's were taken every 3 hours to coincide with meteorological observations and encoded and transmitted according to the IGOSS format.
- 2) Salinity sample daily from the seawater loop at 0000 hrs. GMT.

II) Biological and Productivity

Samples were obtained as follows:

- 1) Daily 150 metre vertical plankton hauls.
- 2) Nitrate sample weekly at 0000 hrs. GMT from the seawater loop.

III) Marine Geochemistry

Samples were obtained as follows:

- 1) Nutrient samples daily at 0000 hrs. GMT from the seawater loop.
- 2) Alkalinity samples every 3 days from the seawater loop.
- 3) Air CO₂ samples weekly in duplicate.

IV) Marine Mammal, Bird and Data for Other Institutes

- 1) Marine mammal and bird observations were recorded.
- 2) Recordings were made from the deep sea tide gauge of the University of Hawaii, Joint Tsunami Research Effort.
- 3) Observation of a 16 foot diameter disc buoy anchored by the University of California.

En route from Station P, mechanical BT's were taken at all Line P hydrographic and BT stations. Salinity, nitrate and nutrient samples were taken from the seawater loop. The surface temperature recorder was run continuously along Line P.

Program of Observations from CCGS Quadra, August 3 to September 19, 1973
(P-73-6) (CODC Ref. No. 15-73-006)

Oceanographic observations were made by Messrs. C. Jackson, J. Pannekoek, and K. Johnson of the Marine Sciences Directorate, Department of the Environment.

En route to Station P, Stations 1 to 7 and 10 to 12 were occupied and a STD profile made to near bottom or 1500 metres. Stations 8 and 9 were missed due to bad weather. Mechanical BT or XBT's were taken at all Line P hydrographic and BT stations. The surface temperature recorder and thermosalinograph were run continuously along Line P. Salinity, nitrate, alkalinity, total CO₂ and hydrocarbon samples were taken from the seawater loop at all stations. The P-CO₂ system was run continuously until Station 5½, when it malfunctioned and was shut down. Four tar ball tows were made at a speed of 4 knots.

At Station P the oceanographic program was carried out as follows:

I) Physical Oceanography

- 1) Profiles of salinity, temperature and oxygen were obtained from six hydrographic stations to near bottom (4200 metres).
- 2) STD profiles to 1500 metres following the hydrographic stations.
- 3) Eleven STD profiles to 300 metres between the hydrographic stations.
- 4) Mechanical BT's were taken every 3 hours to coincide with meteorological observations and encoded and transmitted according to the IGOSS format.
- 5) The surface temperature recorder was run from about one half hour before to one half hour after and during all hydrographic and STD stations.
- 6) Salinity sample daily from the seawater loop at 0000 hrs. GMT.
- 7) The wave recorder was run every 3 hours for 20 minutes to coincide with the meteorological observations.

II) Biological and Productivity

Samples were obtained as follows:

- 1) Plankton
A total of 34-150 metre, 2-1200 metre vertical plankton hauls, 9-10 minute horizontal surface tows and daily sample for micro-organisms taken from the seawater loop.
- 2) Three profiles to 200 metres and three surface samples for plant pigment, nitrate and C-14 productivity.
- 3) The high frequency echo sounder was run twice daily from 0900-1100 local time and from one hour before to one hour after sunset.
- 4) A few hundred pomfret and one 18" mackerel jack were caught in the fishing program.

III) Marine Geochemistry

Samples were obtained as follows:

- 1) Oxygen samples were taken from all hydrographic stations. Once duplicates were taken to compare the results of a modified oxygen titration kit to the existing one.
- 2) Alkalinity samples were taken in duplicate, together with an oxygen sample, every 3 days at 0000 hrs. GMT from the seawater loop. One alkalinity sample was analyzed on board and the other preserved for shore analysis.
- 3) Five alkalinity and total CO₂ samples were taken from depths to 500 metres on the weekly hydrographic stations. The alkalinity samples were analyzed on board. Duplicate samples were taken from one station for storage test.

- 4) One profile to 4200 metres for total CO₂ and alkalinity, temperature, salinity and oxygen data were also taken.
- 5) Nutrient samples were taken from depths to 500 metres on one of the weekly hydrographic stations.
- 6) A tritium profile was obtained from depths to 500 metres together with temperature and salinity data.
- 7) Rainwater and surface seawater samples were collected for tritium analysis.
- 8) Nutrient and salinity samples daily at 0000 hrs. GMT, plus hourly sampling for one 24 hour period from the seawater loop.
- 9) Air CO₂ samples weekly in duplicate.
- 10) Two seawater C-14 samples from the seawater loop and two collected with a Hydro-Bio 200 litre sampler. With the loop samples, air C-14, air C-13, seawater C-13, salinity and alkalinity samples were also taken at this time.
- 11) A 50 litre water sample (metal free) was taken from 4000 metres with 2-30 litre Niskin samplers. Sample was acidified and frozen. A smaller sample was taken in glass, acidified and kept at room temperature. Temperature, salinity, oxygen, pH, alkalinity and total CO₂ samples were taken of the same water.
- 12) The P-CO₂ system was run on station and notated about every 4 hours. The system was shut down several times for repairs or adjustments.
- 13) Hydrocarbon samples were collected daily, and once every 3 hours for a 24 hour period. Samples were analyzed on board.
- 14) Three tar ball tows were made at a speed of 4 knots.

IV) Marine Mammal, Bird and Data for Other Institutes

- 1) Marine mammal and bird observations were recorded.
- 2) Twice in the early part of the cruise a signal was received and recorded from the deep sea tide gauge of the University of Hawaii, Joint Tsunami Research Effort.
- 3) Plankton samples were taken from the seawater loop at all Line P inbound stations for the Institute of Oceanography, University of British Columbia.

En route from Station P, all stations except Stations 12, 11, 6 and 5 were occupied and a STD cast made to near bottom or 1500 metres. Stations 12, 11, 6 and 5 were missed due to bad weather. Mechanical BT or XBT's were taken at all Line P hydrographic and BT stations. The surface temperature recorder, thermosalinograph and P-CO₂ system were run continuously along Line P. Salinity, nitrate, alkalinity, total CO₂ and hydrocarbon samples were taken from the seawater loop at all stations.

Data was processed by Messrs. C. de Jong, B. Minkley, E. Marles, and E. Luscombe, and assembled and edited for publication by Mr. C. de Jong.

Observational Procedures

Temperatures at depth were measured by deep-sea reversing thermometers of German (Richter and Wiese) or Japanese (Yoshino Keiko Co.) manufacture. Two protected thermometers were used on all Nansen bottles, and one unprotected thermometer was used on each bottle at depths of 300 m or greater. The accuracy of protected reversing thermometers is believed to be $\pm 0.02^{\circ}\text{C}$.

Surface water temperatures were measured from a bucket sample using a deck thermometer of $\pm 0.1^{\circ}\text{C}$ accuracy.

Salinity determinations were made aboard ship with either an Auto-Lab Model 601 Mark III inductive salinometer or a Hytech Model 6220 lab salinometer. Accuracy using duplicate determinations is estimated to be ± 0.003 ppt.

Depth determinations were made using the "depth difference" method described in the U.S.N. Hydrographic Office Publication No. 607 (1955). Depth estimates have an approximate accuracy of ± 5 m for depths less than 1000 m, and $\pm 0.5\%$ of depth for depths greater than 1000 m.

The dissolved oxygen analyses were done in the shipboard laboratory by a modified Winkler method (Carpenter, 1965).

Line P engine intake continuous temperatures on both ships were recorded by a Honeywell Model 15303836 Recorder. The temperature probe is at a depth of approximately 3 metres below the sea surface and the instrument accuracy is believed to be $\pm 0.1^{\circ}\text{C}$.

CCGS Quadra is equipped with a Bissett Berman Model 6600-T thermosalinograph which is used, on Line P, for continuous recording of surface temperatures and salinities from the ship's seawater loop. The temperature probe is mounted at the seawater loop intake (approximately 3 metres below the surface) and the salinity probe and recorder is situated in the dry lab. The accuracy of this instrument is believed to be $\pm 0.1^{\circ}\text{C}$ for temperature and ± 0.1 ppt for salinity.

CCGS Vancouver and CCGS Quadra were equipped with a Bissett-Berman Model 9006 STD.

Computations

All hydrographic data were processed with the aid of an IBM 360 computer. Reversing thermometer temperature corrections, thermometric depth calculations, and accepted depth from the "depth difference" method were computed. Extraneous thermometric depths caused by thermometer malfunctions are automatically edited and replaced. A Calcomp 565 Offline Plotter was used to plot temperature-salinity and temperature-oxygen diagrams, as well as plots of temperature, salinity and dissolved oxygen vs \log_{10} depth. These plots were used to check the data for errors.

Missing hydrographic data were obtained using a weighted parabolas interpolation method (Reiniger and Ross, 1968). These data are indicated with an asterisk in this data record.

Data values which we suspect but which we have included in this data record are indicated with a plus. These data have been removed from punch card and magnetic tape records.

Analog records from the salinity-temperature-pressure instrument have been machine digitized, then replotted using the Calcomp Plotter.

Digitization was continued until original and computer plotted traces were coincident. Temperature and salinity values were listed at standard pressures; integrals (depths, geopotential anomaly, and potential energy anomaly) were computed from the entire array of digitized data.

The headings for the data listings are explained as follows:

PRESS	is pressure (decibars)
TEMP	is temperature (degrees Celsius)
SAL	is salinity (parts per thousand)
DEPTH	is reported in metres
SIGMA-T	is specific gravity anomaly
SVA	is specific volume anomaly
THETA	is potential temperature (degrees Celsius)
SVA (THETA)	is potential specific volume anomaly
DELTA D	is geopotential anomaly (J/kg)
POT EN	is potential energy in units of 10^8 ergs/cm ²
OXY	is the concentration of dissolved oxygen expressed in millilitres per litre
B-V PERIOD	is the Brunt-Vaisala period in minutes

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- Reiniger, R.F., and C.K. Ross. 1968. A method of interpolation with application to oceanographic data. *Deep Sea Res.*, 15: 185-193.
- U.S.N. Hydrographic Office. 1955. Instruction manual for oceanographic observations, Publ. no. 607.

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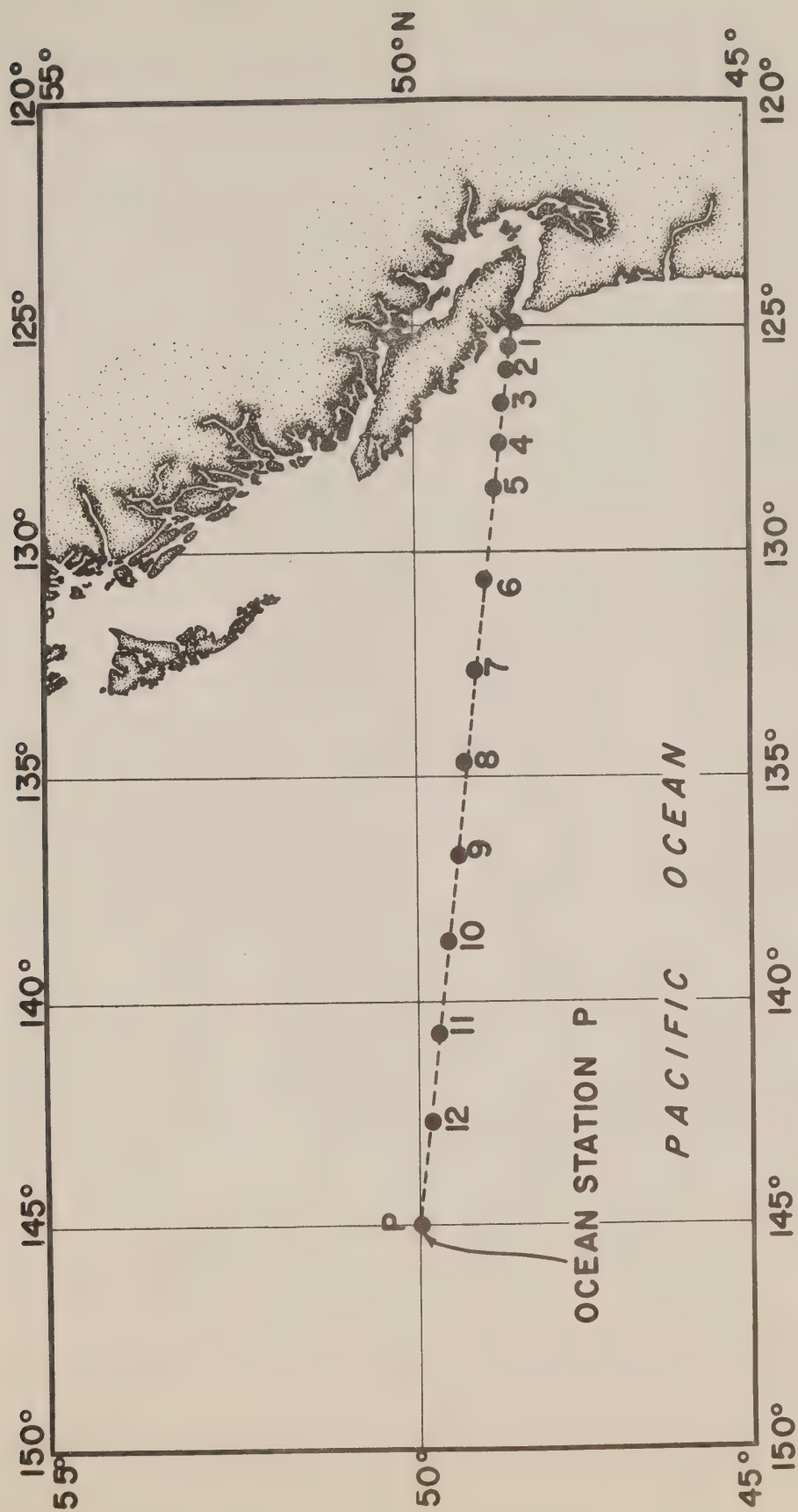


Fig. 1 Chart showing Line P station positions.

OCEANOGRAPHIC DATA OBTAINED ON CRUISE P-73-4
(CODC REFERENCE NO. 15-73-004)

RESULTS OF HYDROGRAPHIC OBSERVATIONS

(P-73-4)

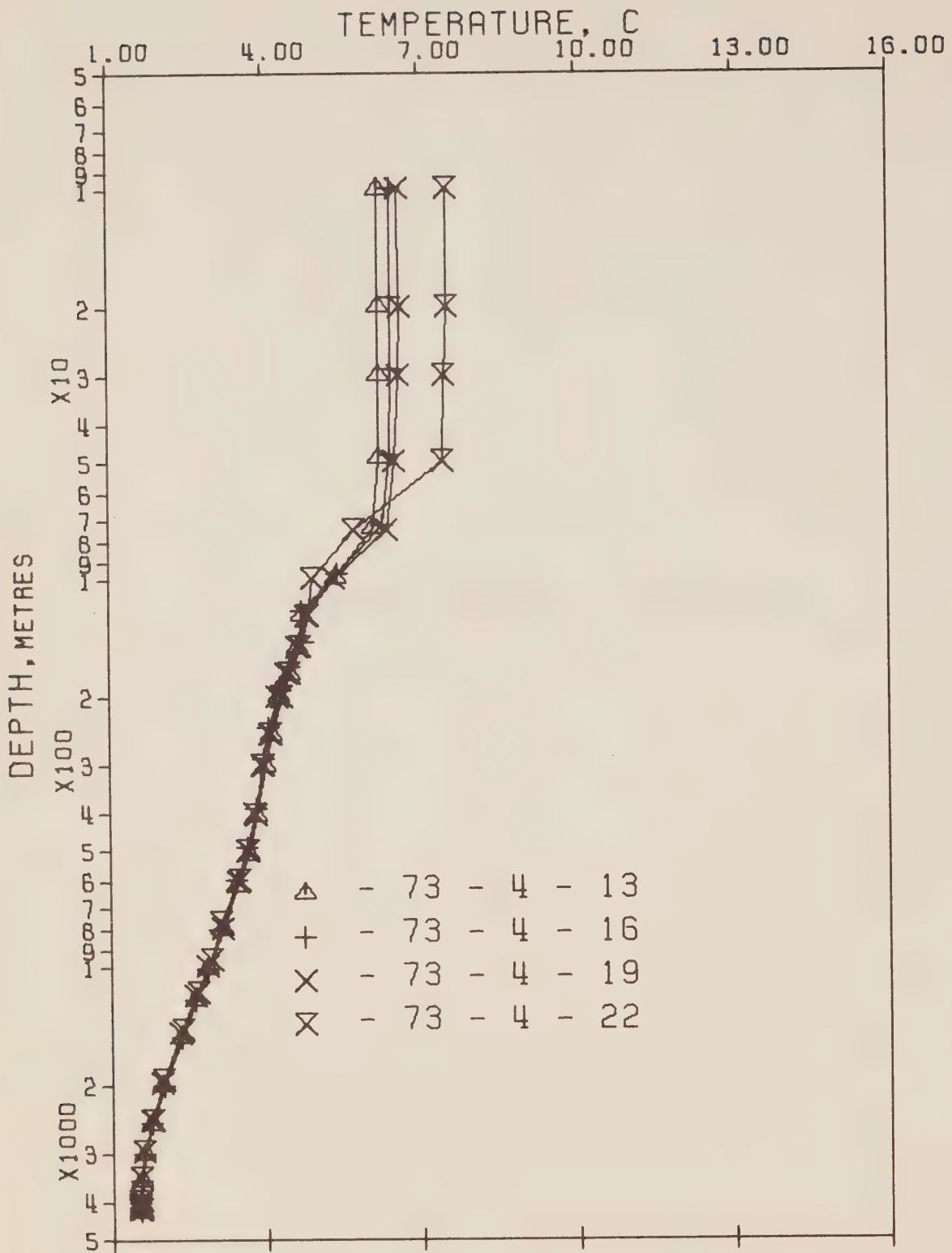


Figure 2 Composite plot of temperature vs \log_{10} depth. P-73-4.

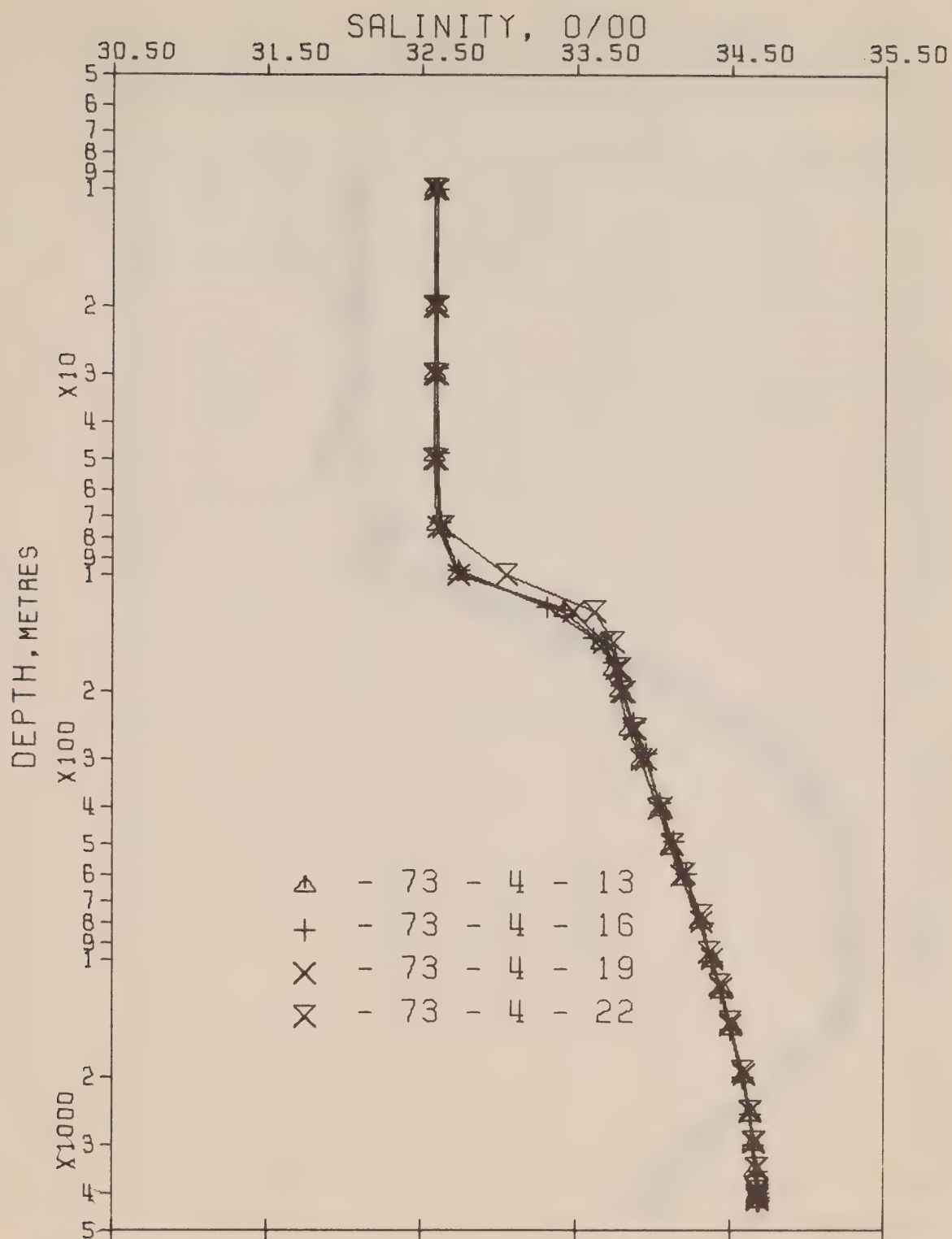


Figure 3 Composite plot of salinity vs \log_{10} depth. P-73-4.

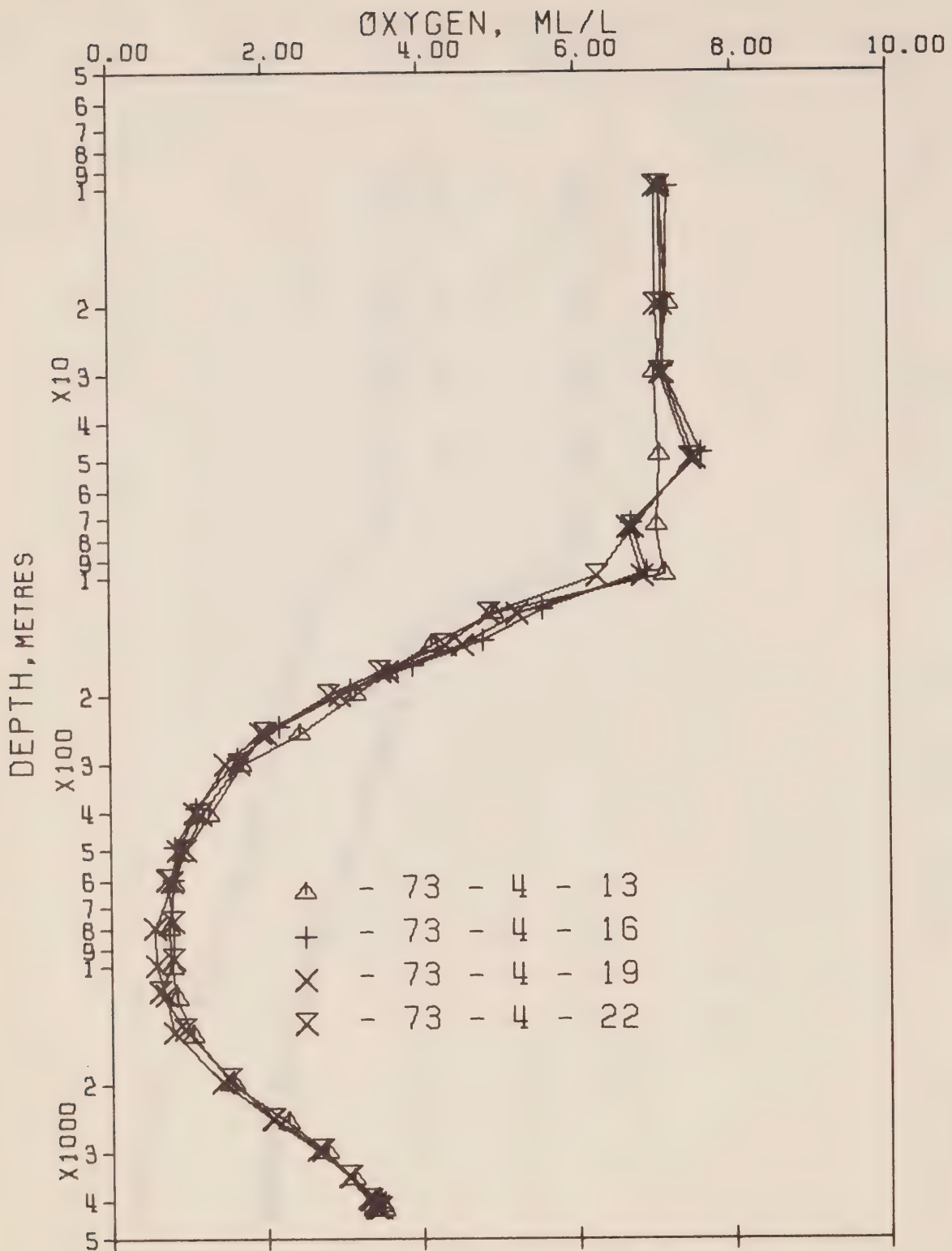
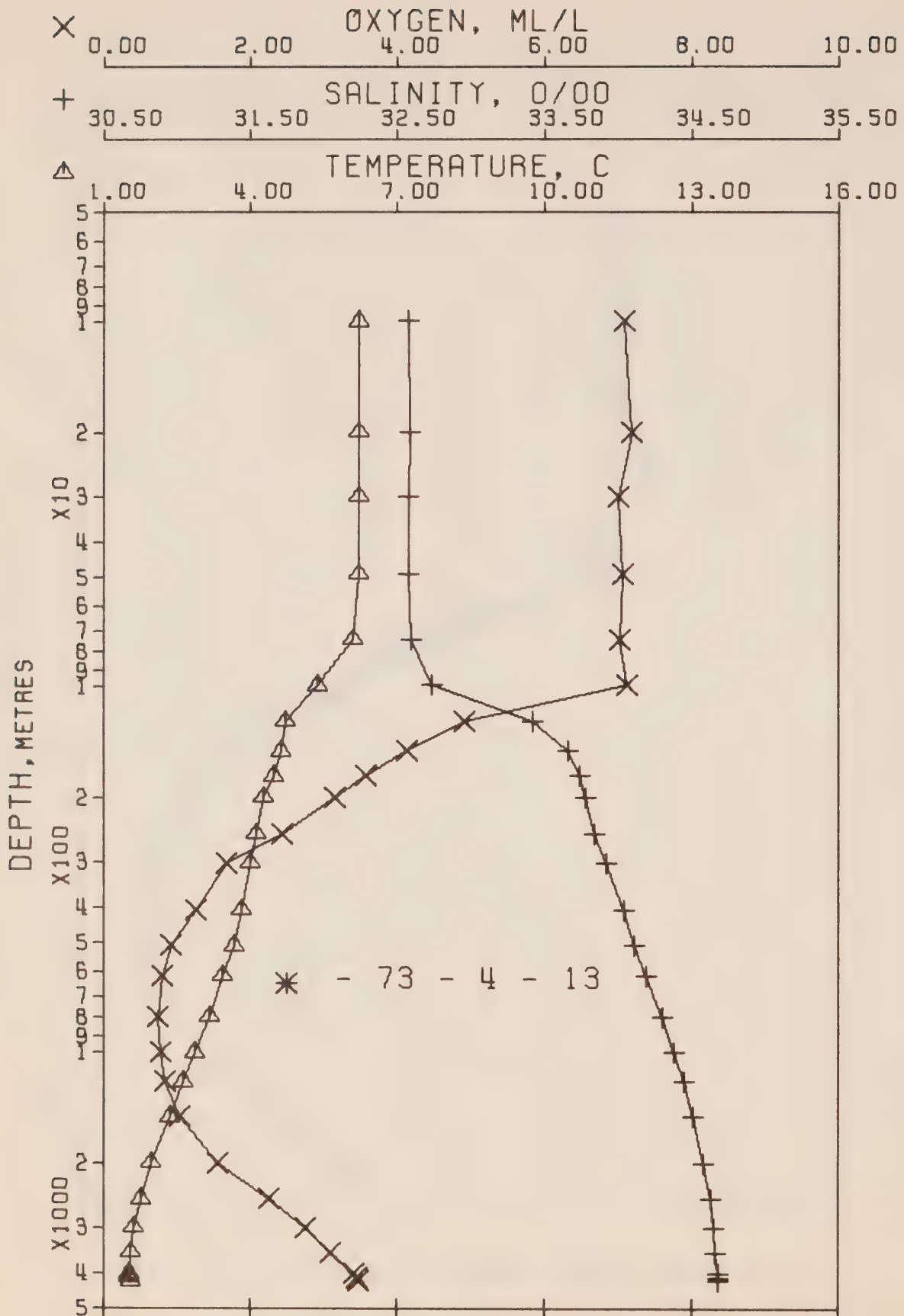


Figure 4 Composite plot of oxygen vs \log_{10} depth. P-73-4.

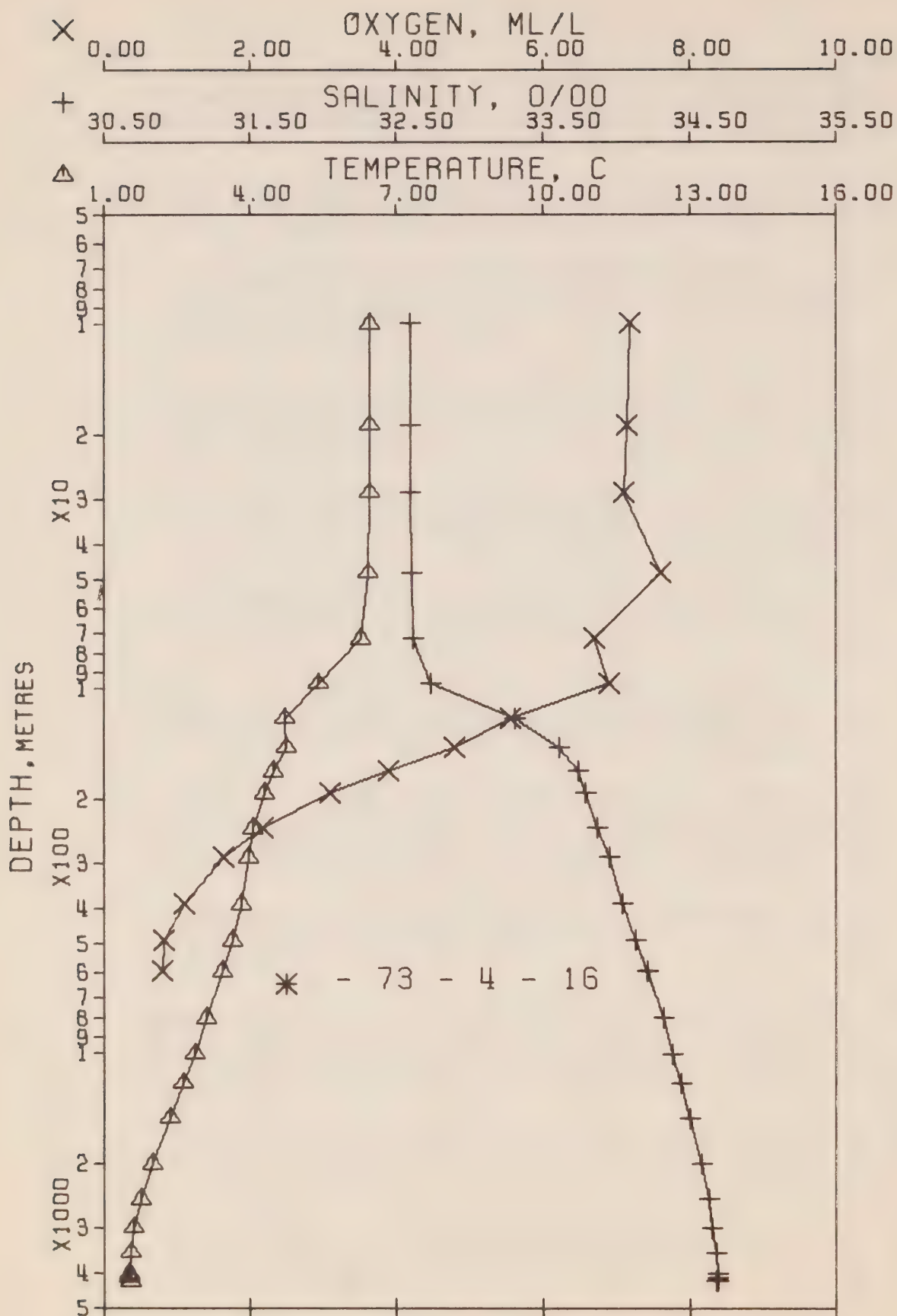


OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50- 0.0 N, 145- 0.0 W GMT 18.3
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 4- 13

DATE 15/ 5/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	6.25	32.572	0	25.630	237.0	6.25	236.7	0.0	0.0	7.18	1473.
10	6.23	32.579	10	25.638	236.3	6.23	236.0	0.24	0.01	7.08	1473.
20	6.23	32.590	20	25.647	235.6	6.23	235.1	0.48	0.05	7.19	1473.
30	6.23	32.582	30	25.641	236.3	6.23	235.7	0.71	0.11	7.00	1473.
49	6.21	32.578	49	25.640	236.6	6.21	235.7	1.17	0.29	7.06	1474.
74	6.10	32.596	74	25.668	234.3	6.09	233.1	1.76	0.67	7.01	1474.
100	5.38	32.743	99	25.870	215.2	5.37	213.9	2.34	1.18	7.11	1471.
125	4.71	33.421	124	26.482	157.2	4.70	155.8	2.80	1.71	4.91	1470.
151	4.64	33.661	150	26.679	138.8	4.63	137.0	3.18	2.25	4.14	1470.
176	4.49	33.743	175	26.761	131.3	4.48	129.2	3.52	2.81	3.58	1470.
201	4.28	33.776	200	26.809	126.8	4.27	124.6	3.85	3.44	3.16	1470.
254	4.11	33.843	252	26.880	120.5	4.09	117.9	4.49	4.94	2.43	1470.
305	4.01	33.917	303	26.949	114.3	3.99	111.3	5.10	6.66	1.67	1470.
410	3.83	34.037	407	27.063	104.3	3.80	100.5	6.24	10.83	1.27	1472.
515	3.67	34.114	511	27.140	97.7	3.63	93.2	7.30	15.83	0.92	1473.
621	3.44	34.193	616	27.225	90.2	3.40	85.0	8.29	21.59	0.80	1474.
805	3.17	34.296	798	27.333	80.9	3.11	74.7	9.86	32.99	0.75	1475.
1009	2.86	34.376	999	27.425	73.0	2.79	65.9	11.42	47.43	0.77	1478.
1212	2.01	34.447	1200	27.503	66.1	2.53	58.4	12.84	63.41	0.83	1480.
1519	2.34	34.506	1502	27.573	60.3	2.24	51.6	14.76	90.22	1.05	1484.
2030	1.97	34.580	2005	27.662	52.8	1.83	42.9	17.63	142.16	1.56	1491.
2542	1.74	34.626	2508	27.717	48.4	1.56	37.5	20.21	202.17	2.25	1499.
3055	1.50	34.654	3010	27.750	46.1	1.37	34.2	22.61	270.82	2.76	1507.
3568	1.54	34.665	3512	27.763	45.9	1.26	32.5	24.97	350.33	3.10	1515.
4093	1.52	34.678	4014	27.775	46.1	1.19	31.1	27.33	442.25	3.42	1524.
4187	1.52	34.676	4115	27.773	46.4	1.18	31.2	27.81	462.47	3.46	1526.
4289	1.53	34.676	4215	27.772	46.9	1.17	31.2	28.28	483.17	3.47	1528.

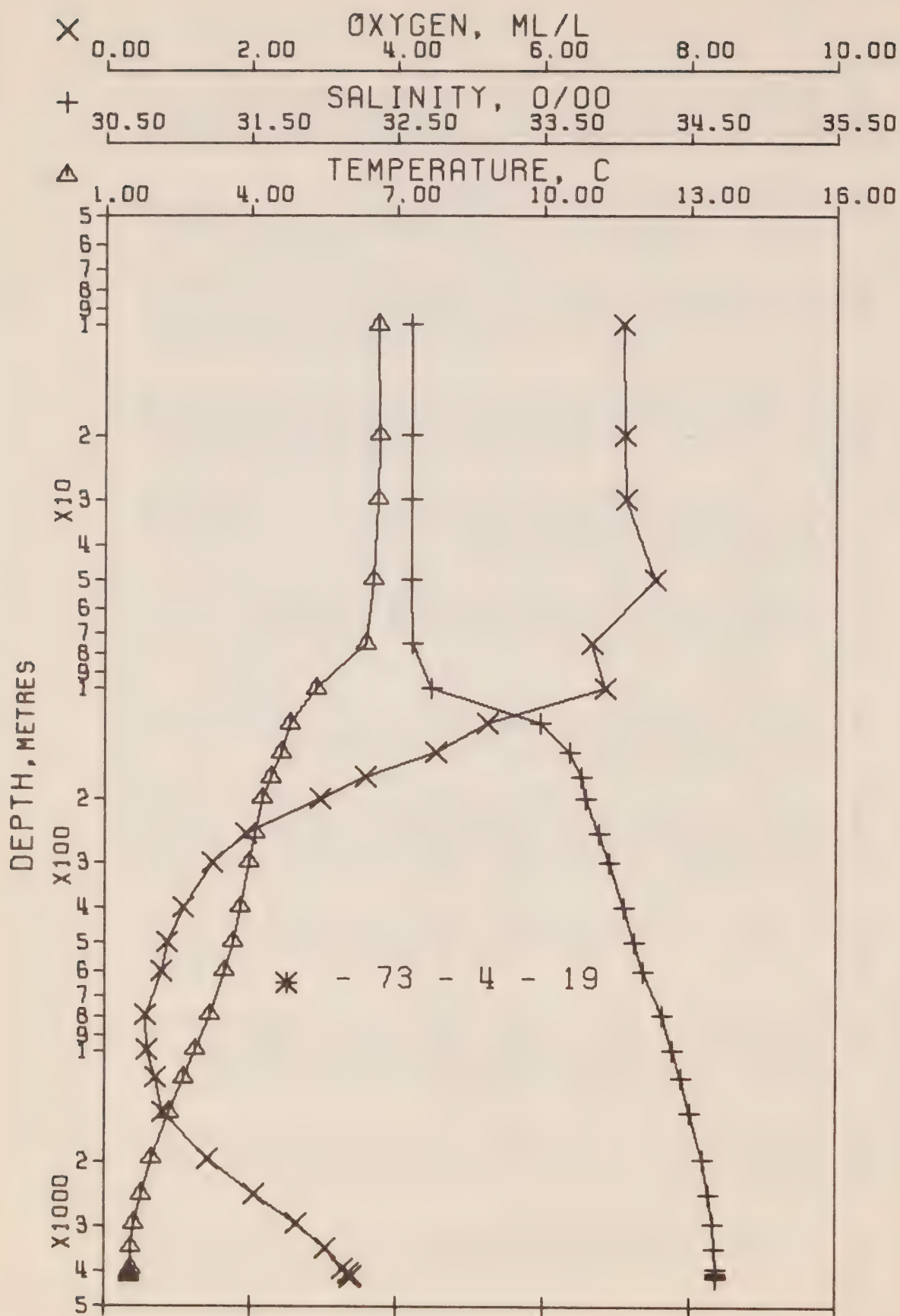


OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50- 0.0 N, 145- 0.0 W GMT 18.4
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 4- 16

DATE 22/ 5/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	6.47	32.601	0	25.625	237.4	6.47	237.2	0.0	0.0	7.12	1474.
10	6.45	32.599	10	25.626	237.4	6.45	237.1	0.24	0.01	7.18	1474.
19	6.46	32.602	19	25.627	237.5	6.46	237.0	0.45	0.04	7.14	1474.
29	6.45	32.604	29	25.630	237.3	6.45	236.7	0.69	0.10	7.10	1474.
48	6.43	32.608	48	25.636	237.0	6.43	235.2	1.15	0.28	7.60	1474.
73	6.27	32.618	73	25.664	234.6	6.26	233.5	1.74	0.65	6.71	1474.
93	5.42	32.739	97	25.362	215.9	5.41	214.6	2.29	1.13	6.90	1471.
122	4.72	33.306	121	26.390	166.0	4.71	164.5	2.76	1.65	5.55	1470.
146	4.74	33.608	145	26.626	143.8	4.73	142.0	3.13	2.15	4.80	1470.
170	4.48	33.743	169	26.762	131.1	4.47	129.2	3.46	2.68	3.91	1470.
195	4.30	33.795	194	26.822	125.5	4.29	123.5	3.78	3.29	3.10	1470.
244	4.07	33.874	242	26.909	117.7	4.05	115.2	4.36	4.60	2.18	1470.
293	3.98	33.951	291	26.979	111.4	3.96	108.5	4.93	6.15	1.63	1470.
393	3.33	34.043	390	27.067	103.7	3.80	100.0	6.00	9.89	1.09	1471.
495	3.04	34.133	491	27.158	95.8	3.61	91.4	7.02	14.49	0.82	1472.
602	3.44	34.209	597	27.238	88.9	3.40	83.8	8.00	20.02	0.80	1473.
807	3.11	34.316	800	27.354	78.9	3.05	72.6	9.72	32.31	0.0	1475.
1013	2.87	34.383	1003	27.429	72.6	2.80	65.4	11.27	46.71	0.0	1473.
1218	2.61	34.445	1205	27.502	66.3	2.53	58.6	12.69	52.83	0.0	1480.
1525	2.34	34.505	1503	27.572	60.5	2.24	51.7	14.02	89.95	0.0	1484.
2035	1.98	34.584	2010	27.665	52.6	1.84	42.7	17.49	141.92	0.0	1491.
2544	1.74	34.632	2510	27.721	47.9	1.56	37.1	20.03	201.26	0.0	1499.
3055	1.59	34.654	3010	27.750	45.9	1.36	34.1	22.42	269.32	0.0	1507.
3557	1.54	34.678	3511	27.773	45.0	1.26	31.6	24.74	347.65	0.0	1515.
4092	1.52	34.686	4013	27.781	45.5	1.19	30.5	27.07	438.66	0.0	1524.
4186	1.51	34.691	4114	27.786	45.3	1.17	30.0	27.54	458.46	0.0	1526.
4279	1.53	34.690	4205	27.784	45.9	1.17	30.1	27.96	476.58	0.0	1523.
4299	1.53	34.682	4215	27.777	46.5	1.17	30.7	28.01	473.65	0.0	1523.

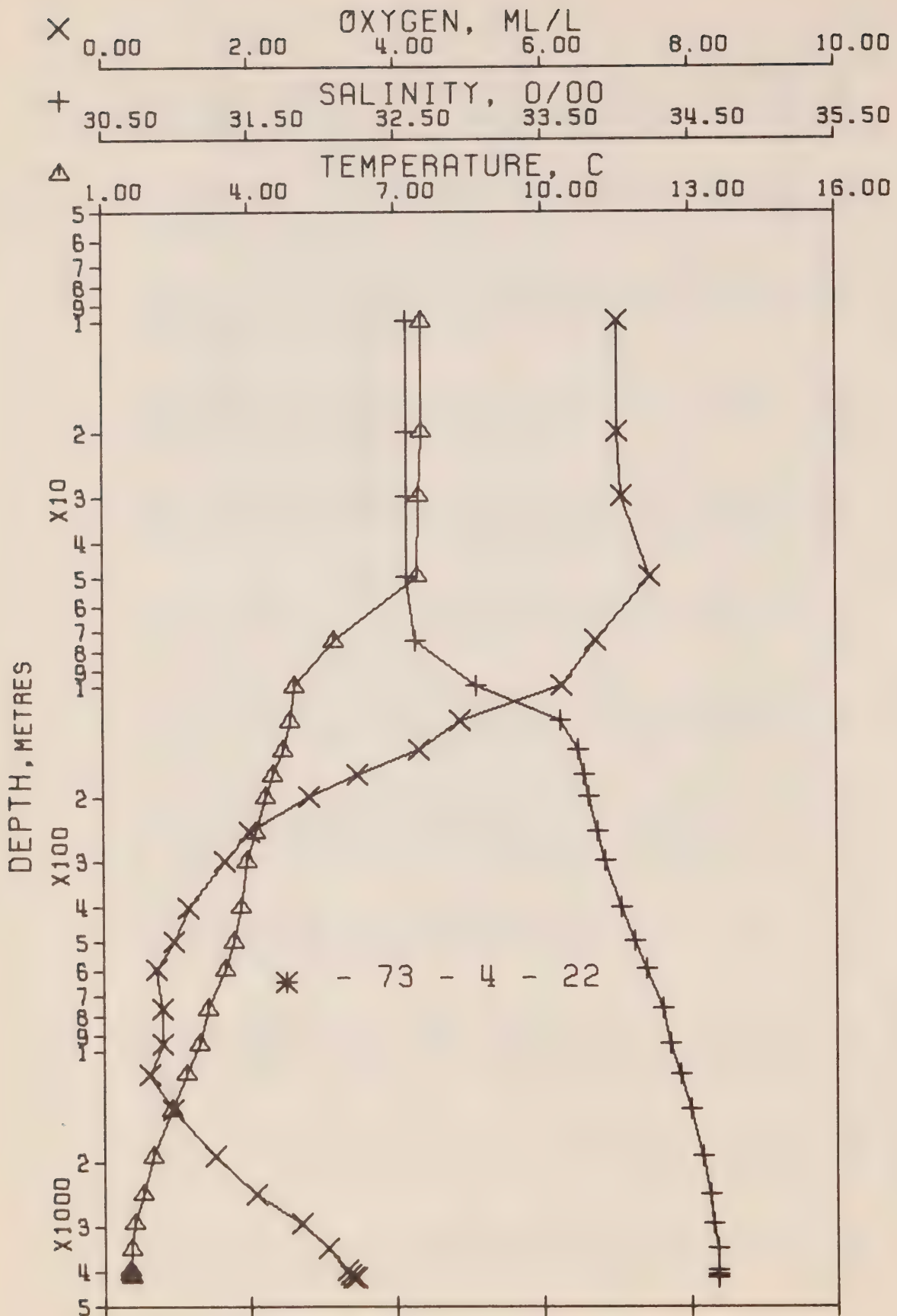


OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50-5.0 N. 144-55.0 W GMT 18.2
 HYDROGRAPHIC CAST DATA

DATE 29/ 5/73

REFERENCE NO. 73- 4- 19

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	6.63	32.600	0	25.604	239.5	6.63	239.3	0.0	0.0	7.13	1474.
10	6.62	32.600	10	25.605	239.5	6.62	239.1	0.24	0.01	7.09	1475.
20	6.64	32.598	20	25.601	240.0	6.64	239.6	0.48	0.05	7.10	1475.
30	6.60	32.601	30	25.609	239.4	6.60	238.8	0.72	0.11	7.12	1475.
50	6.53	32.604	50	25.620	238.6	6.53	237.6	1.20	0.31	7.53	1475.
75	6.36	32.611	75	25.647	236.3	6.35	235.1	1.81	0.69	6.66	1475.
101	5.36	32.736	100	25.867	215.5	5.35	214.2	2.34	1.21	6.85	1471.
120	4.42	33.482	125	26.518	153.9	4.81	152.3	2.85	1.75	5.25	1470.
151	4.63	33.680	150	26.696	137.2	4.62	135.5	3.21	2.25	4.54	1470.
176	4.42	33.757	175	26.779	129.4	4.41	127.5	3.54	2.81	3.58	1470.
201	4.25	33.795	200	26.827	125.1	4.24	122.9	3.86	3.43	2.97	1470.
252	4.08	33.880	250	26.913	117.4	4.06	114.9	4.47	4.84	1.94	1470.
302	3.93	33.952	300	26.990	111.4	3.96	108.4	5.05	6.46	1.48	1470.
403	3.79	34.055	400	27.081	102.5	3.76	98.8	6.12	10.33	1.08	1471.
504	3.65	34.125	500	27.151	96.6	3.61	92.1	7.12	14.97	0.85	1472.
605	3.45	34.194	600	27.217	90.8	3.41	85.7	8.07	20.32	0.77	1473.
797	3.15	34.309	790	27.345	79.7	3.10	73.6	9.70	31.98	0.56	1475.
994	2.36	34.383	984	27.430	72.4	2.79	65.4	11.19	45.55	0.59	1477.
1191	2.63	34.438	1179	27.494	66.9	2.55	59.2	12.56	60.84	0.70	1480.
1439	2.33	34.501	1473	27.570	60.4	2.23	52.0	14.46	86.69	0.80	1484.
1991	1.96	34.586	1967	27.668	52.1	1.82	42.5	17.26	136.31	1.41	1490.
2497	1.75	34.631	2464	27.720	48.0	1.57	37.2	19.77	193.92	2.07	1498.
3006	1.59	34.663	2962	27.758	45.2	1.37	33.5	22.13	259.98	2.63	1506.
3513	1.53	34.675	3453	27.772	44.9	1.26	31.8	24.40	335.57	3.05	1514.
4018	1.53	34.684	3951	27.779	45.6	1.20	30.7	26.69	423.31	3.28	1523.
4119	1.51	34.683	4049	27.779	45.7	1.17	30.6	27.14	442.34	3.37	1525.
4209	1.51	34.682	4137	27.779	46.0	1.16	30.6	27.56	459.91	3.41	1526.
4220	1.52	34.684	4147	27.779	46.0	1.17	30.6	27.61	461.93	3.38	1527.



OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50- 0.0 N, 145- 0.0 W GMT 17.9
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 4- 22

DATE 17/ 6/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	7.55	32.586	0	25.469	252.4	7.55	252.2	0.0	0.0	6.97	1478.
10	7.54	32.578	10	25.464	253.0	7.54	252.6	0.25	0.01	7.03	1478.
20	7.55	32.582	20	25.466	252.9	7.55	252.4	0.51	0.05	7.02	1478.
30	7.49	32.581	30	25.473	252.3	7.49	251.6	0.76	0.12	7.07	1478.
50	7.44	32.582	50	25.481	251.9	7.44	250.9	1.27	0.33	7.47	1478.
75	5.75	32.643	75	25.748	226.6	5.74	225.5	1.88	0.72	6.72	1472.
101	4.93	33.053	100	26.166	187.0	4.92	185.7	2.40	1.19	6.25	1470.
126	4.83	33.620	125	26.626	143.6	4.82	142.1	2.82	1.66	4.87	1471.
151	4.69	33.741	150	26.737	133.3	4.68	131.5	3.16	2.14	4.32	1471.
176	4.48	33.779	175	26.790	128.5	4.47	125.4	3.49	2.69	3.48	1470.
202	4.33	33.807	201	26.829	125.0	4.32	122.8	3.82	3.33	2.81	1470.
253	4.11	33.867	251	26.899	118.7	4.09	116.1	4.43	4.76	2.00	1470.
304	3.94	33.921	302	26.959	113.3	3.92	110.3	5.03	6.45	1.65	1470.
406	3.81	34.027	403	27.057	104.8	3.78	101.0	6.14	10.47	1.16	1471.
506	3.67	34.124	502	27.148	96.9	3.63	92.3	7.15	15.15	0.96	1473.
602	3.50	34.202	597	27.226	90.1	3.46	84.8	8.04	20.22	0.72	1474.
771	3.12	34.309	764	27.348	79.3	3.07	73.3	9.46	30.15	0.81	1475.
966	2.94	34.360	957	27.405	74.8	2.87	67.8	10.96	43.44	0.80	1477.
1164	2.68	34.430	1152	27.484	67.9	2.60	60.3	12.37	58.73	0.62	1480.
1463	2.37	34.504	1447	27.569	60.5	2.27	52.1	14.28	84.30	0.93	1483.
1969	1.99	34.579	1945	27.660	52.8	1.85	43.2	17.12	133.95	1.52	1490.
2482	1.78	34.626	2449	27.714	48.7	1.60	37.9	19.71	192.76	2.07	1498.
2998	1.60	34.654	2955	27.750	45.9	1.38	34.2	22.14	260.74	2.71	1506.
3516	1.54	34.676	3461	27.772	45.0	1.27	31.8	24.48	338.51	3.06	1515.
4033	1.51	34.682	3965	27.779	45.5	1.18	30.7	26.82	428.34	3.33	1523.
4135	1.51	34.684	4065	27.780	45.6	1.17	30.6	27.29	447.79	3.37	1525.
4228	1.54	34.683	4155	27.777	46.4	1.19	30.7	27.71	465.84	3.43	1527.
4238	1.54*	34.681	4165	27.775	46.6	1.19	30.9	27.76	467.90	3.40	1527.

RESULTS OF STD OBSERVATIONS

(P-73-4)

SALINITY DIFFERENCE, BOTTLE - S.T.D. ‰

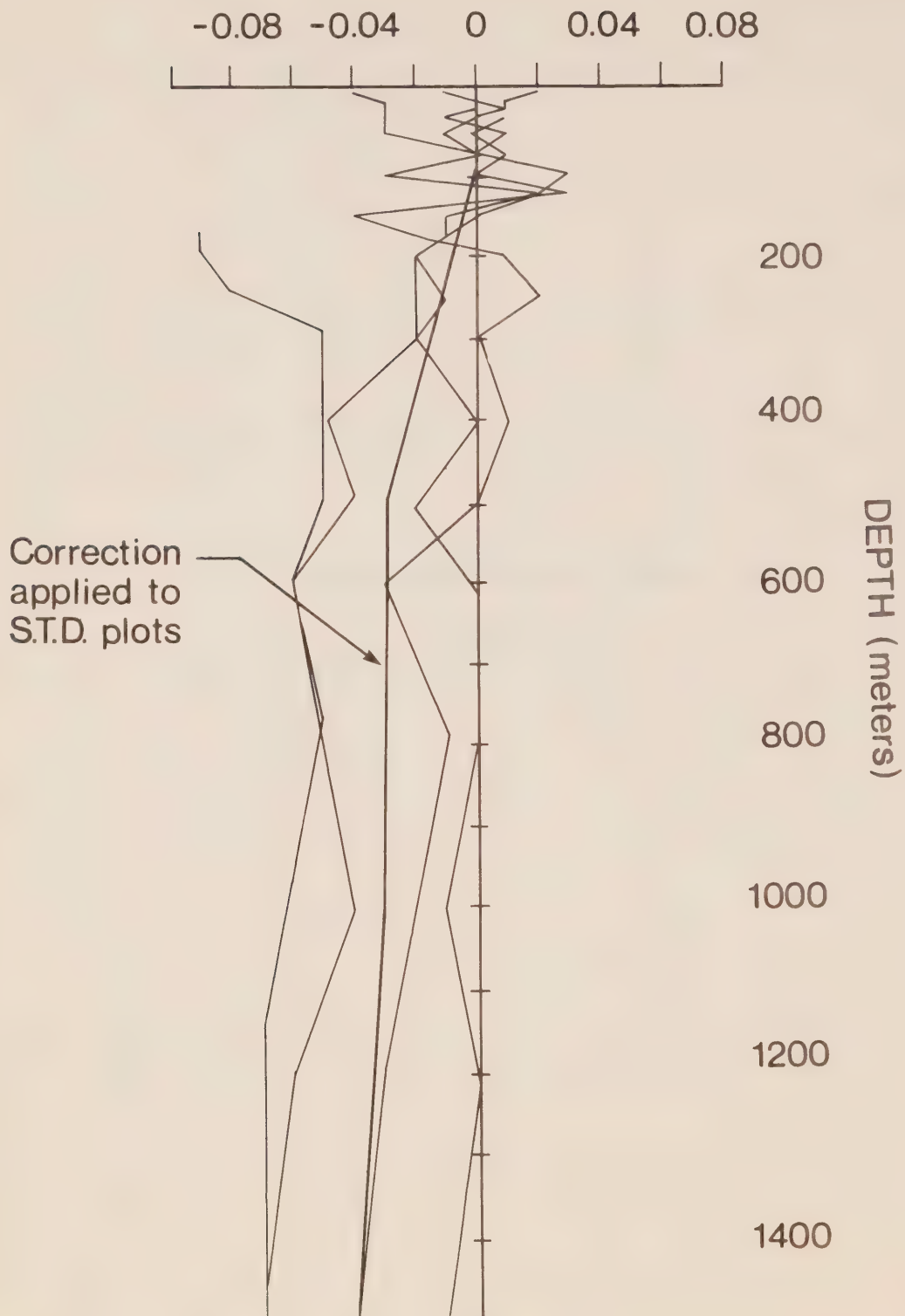


Figure 5 Salinity difference between hydro data and STD. P-73-4.

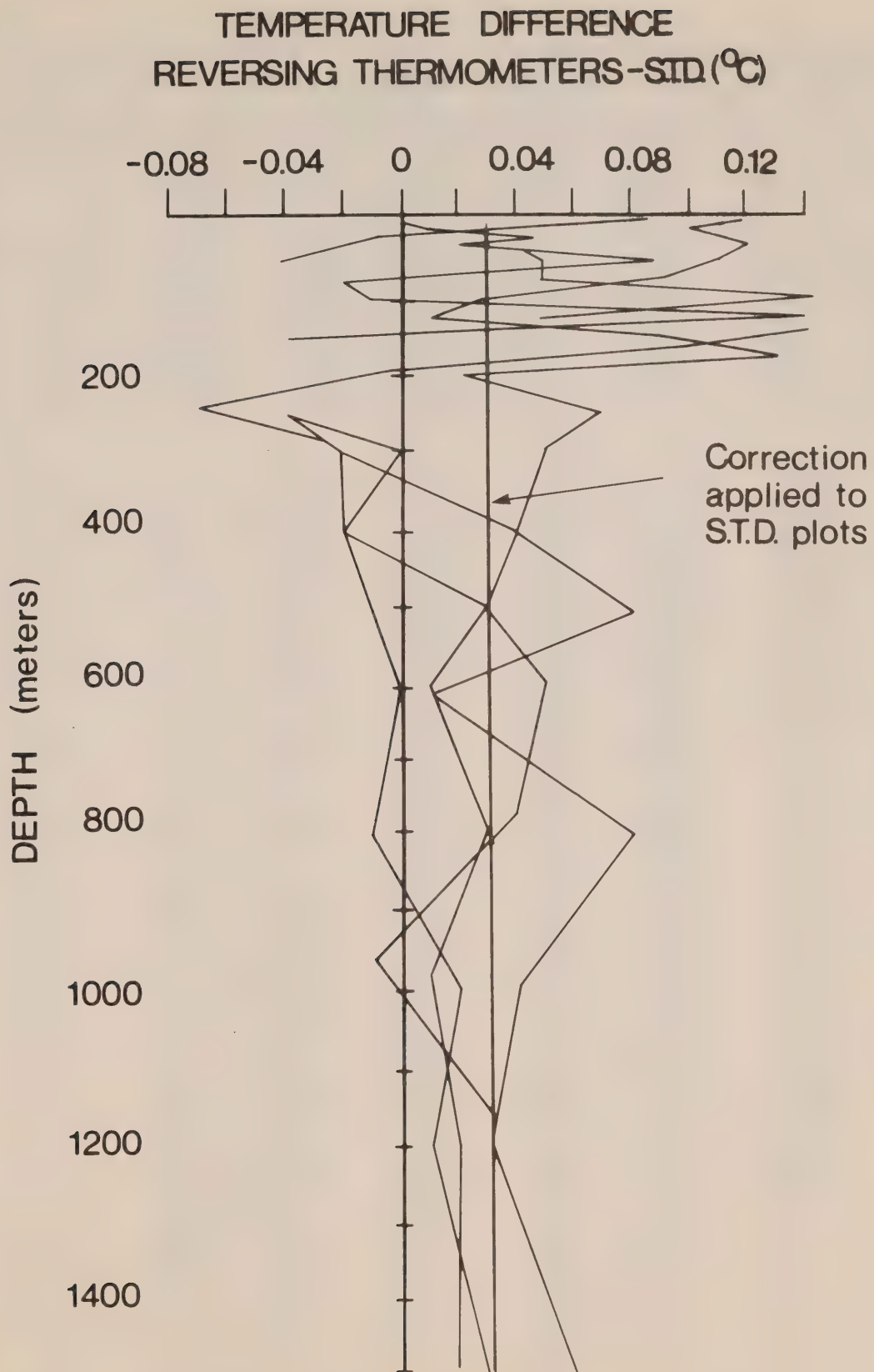


Figure 6 Temperature difference between hydro data and STD. P-73-4.

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 4- I

DATE 11/ 5/73

POSITION 48-33.0N, 125-32.0W

GMT 23.7

RESULTS OF STP CAST

99 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.17	32.03	0	24.63	331.8	0.0	0.0	1487.
10	9.66	32.03	10	24.72	324.2	0.33	0.02	1485.
20	8.82	32.19	20	24.97	299.9	0.64	0.06	1483.
30	8.44	32.35	30	25.16	282.6	0.93	0.14	1482.
50	7.69	32.84	50	25.65	235.7	1.46	0.35	1480.
75	7.31	33.42	75	26.16	188.1	2.00	0.70	1479.
100	7.01	33.61	99	26.35	170.3	2.44	1.09	1479.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	10.17	32.03	27.	8.52	32.25	72.	7.38	33.27
2.	10.10	32.03	29.	8.46	32.28	73.	7.38	33.32
2.	10.15	32.03	30.	8.44	32.35	73.	7.36	33.35
4.	10.01	32.03	31.	8.26	32.36	74.	7.35	33.41
4.	10.05	32.03	33.	8.25	32.36	76.	7.27	33.43
5.	10.02	32.03	35.	8.25	32.40	78.	7.25	33.46
6.	10.05	32.03	35.	8.23	32.39	79.	7.25	33.46
7.	10.07	32.03	36.	8.23	32.42	79.	7.23	33.46
7.	9.93	32.03	38.	8.15	32.47	80.	7.23	33.46
8.	9.88	32.03	40.	8.05	32.55	81.	7.23	33.48
9.	9.75	32.03	41.	8.00	32.56	82.	7.23	33.48
10.	9.66	32.03	42.	7.99	32.56	83.	7.22	33.48
10.	9.63	32.03	43.	7.98	32.60	84.	7.20	33.50
11.	9.50	32.06	44.	7.94	32.63	85.	7.19	33.50
11.	9.48	32.06	45.	7.89	32.69	86.	7.18	33.55
12.	9.41	32.06	46.	7.87	32.74	88.	7.08	33.58
13.	9.31	32.09	49.	7.75	32.83	89.	7.08	33.59
13.	9.29	32.09	49.	7.70	32.84	90.	7.07	33.59
13.	9.20	32.09	51.	7.69	32.85	90.	7.06	33.59
14.	9.11	32.09	51.	7.69	32.85	93.	7.06	33.59
15.	9.07	32.10	55.	7.69	32.86	93.	7.04	33.59
17.	8.98	32.12	56.	7.69	32.90	95.	7.03	33.60
18.	8.95	32.16	56.	7.63	32.94	95.	7.02	33.60
18.	8.93	32.16	58.	7.58	32.97	96.	7.02	33.61
19.	8.78	32.16	59.	7.56	32.98	100.	7.01	33.61
19.	8.78	32.16	59.	7.56	32.98	101.	7.01	33.62
20.	8.82	32.19	60.	7.56	32.99	101.	7.00	33.62
21.	8.70	32.19	61.	7.55	33.02	105.	6.99	33.62
22.	8.69	32.20	67.	7.55	33.07	106.	6.97	33.62
23.	8.68	32.22	68.	7.50	33.19	108.	6.97	33.62
23.	8.64	32.22	69.	7.38	33.25	113.	6.97	33.62
25.	8.59	32.23	70.	7.38	33.26			
26.	8.57	32.23	71.	7.38	33.26			
27.	8.56	32.25	72.	7.38	33.27			

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 4- 2

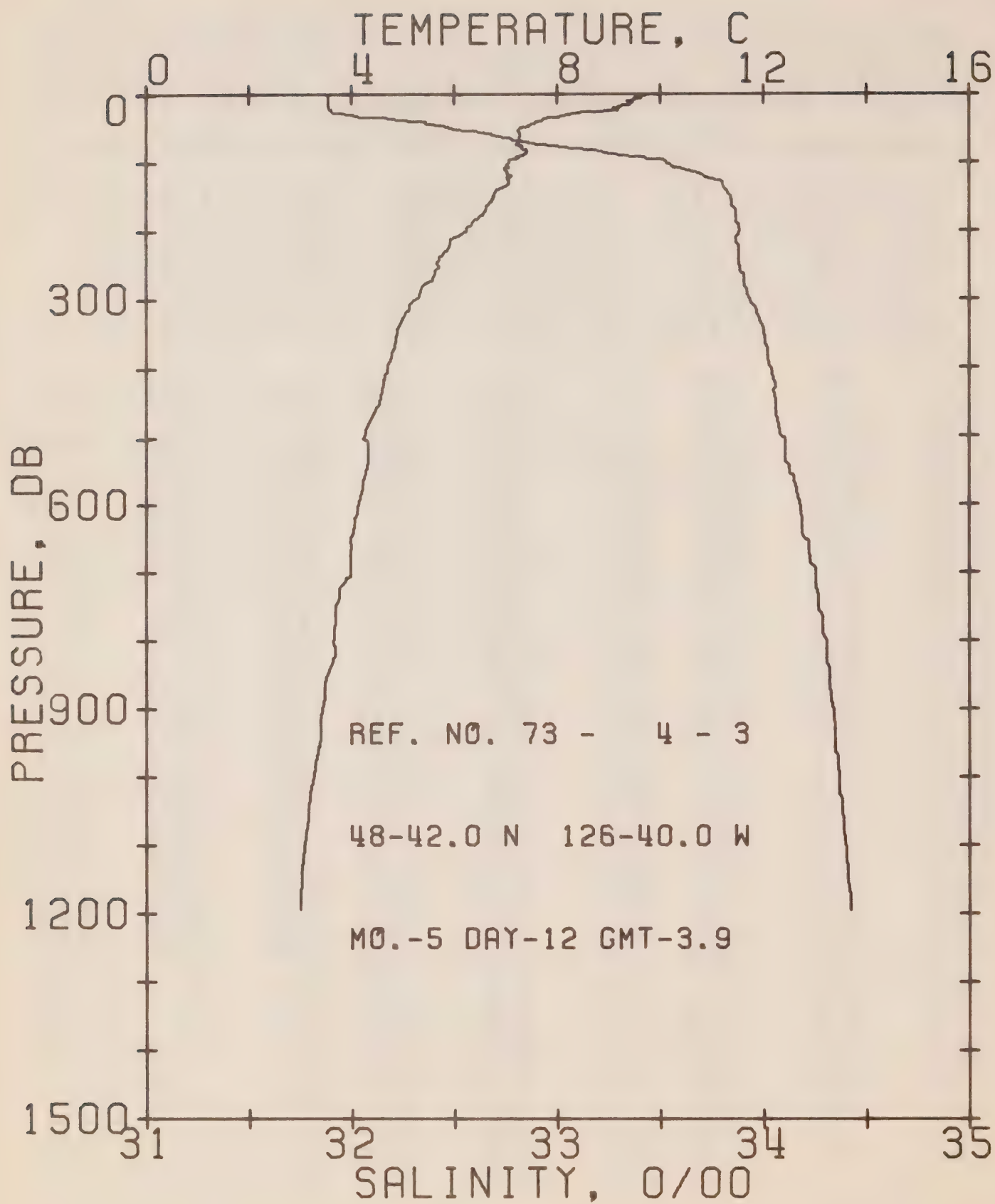
DATE 12/ 5/73

POSITION 48-38.0N, 126- 0.0W GMT 1.6

RESULTS OF STP CAST 87 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.32	31.81	0	24.44	350.5	0.0	0.0	1487.
10	9.85	31.79	10	24.50	345.0	0.35	0.02	1486.
20	9.44	31.82	20	24.59	336.2	0.69	0.07	1485.
30	8.91	31.76	30	24.78	318.4	1.02	0.15	1483.
50	7.34	32.92	50	25.76	225.3	1.52	0.36	1478.
75	7.29	33.22	75	26.00	202.5	2.06	0.70	1479.
100	7.00	33.77	99	26.47	158.3	2.50	1.09	1479.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	10.32	31.81	38.	7.41	32.62	82.	7.22	33.46
1.	10.34	31.80	40.	7.41	32.64	82.	7.20	33.47
1.	10.30	31.80	41.	7.40	32.65	84.	7.19	33.50
4.	10.14	31.79	42.	7.38	32.68	84.	7.18	33.52
4.	10.10	31.79	43.	7.37	32.72	86.	7.18	33.56
5.	10.09	31.79	44.	7.37	32.75	86.	7.15	33.62
6.	9.94	31.79	45.	7.36	32.76	86.	7.14	33.64
9.	9.86	31.79	45.	7.36	32.86	87.	7.10	33.64
12.	9.84	31.79	46.	7.34	32.87	88.	7.10	33.65
16.	9.82	31.79	47.	7.34	32.89	89.	7.10	33.67
17.	9.79	31.79	48.	7.34	32.90	93.	7.09	33.67
13.	9.65	31.82	50.	7.34	32.92	93.	7.09	33.69
19.	9.51	31.82	51.	7.34	32.93	94.	7.08	33.69
21.	9.37	31.83	53.	7.34	32.93	95.	7.08	33.70
22.	9.36	31.85	56.	7.34	32.97	96.	7.07	33.72
23.	9.30	31.86	56.	7.36	32.97	96.	7.06	33.72
24.	9.21	31.86	57.	7.35	32.97	97.	7.04	33.73
25.	9.15	31.90	58.	7.35	32.99	100.	7.00	33.77
26.	9.01	31.91	59.	7.34	33.00	101.	6.98	33.78
27.	9.00	31.91	60.	7.34	33.01	103.	6.96	33.78
28.	8.94	31.93	61.	7.33	33.05	103.	6.94	33.78
29.	8.92	31.94	61.	7.32	33.06	109.	6.94	33.79
30.	8.91	31.96	63.	7.32	33.07	110.	6.92	33.79
31.	8.69	32.00	65.	7.32	33.10			
32.	8.42	32.19	68.	7.32	33.12			
33.	8.18	32.35	70.	7.30	33.13			
34.	7.63	32.44	71.	7.28	33.20			
35.	7.60	32.46	74.	7.29	33.22			
35.	7.60	32.49	77.	7.30	33.23			
36.	7.55	32.52	78.	7.30	33.30			
37.	7.54	32.56	79.	7.30	33.33			
38.	7.47	32.62	80.	7.24	33.39			



OFFSHORE OCEANOGRAPHY GROUP

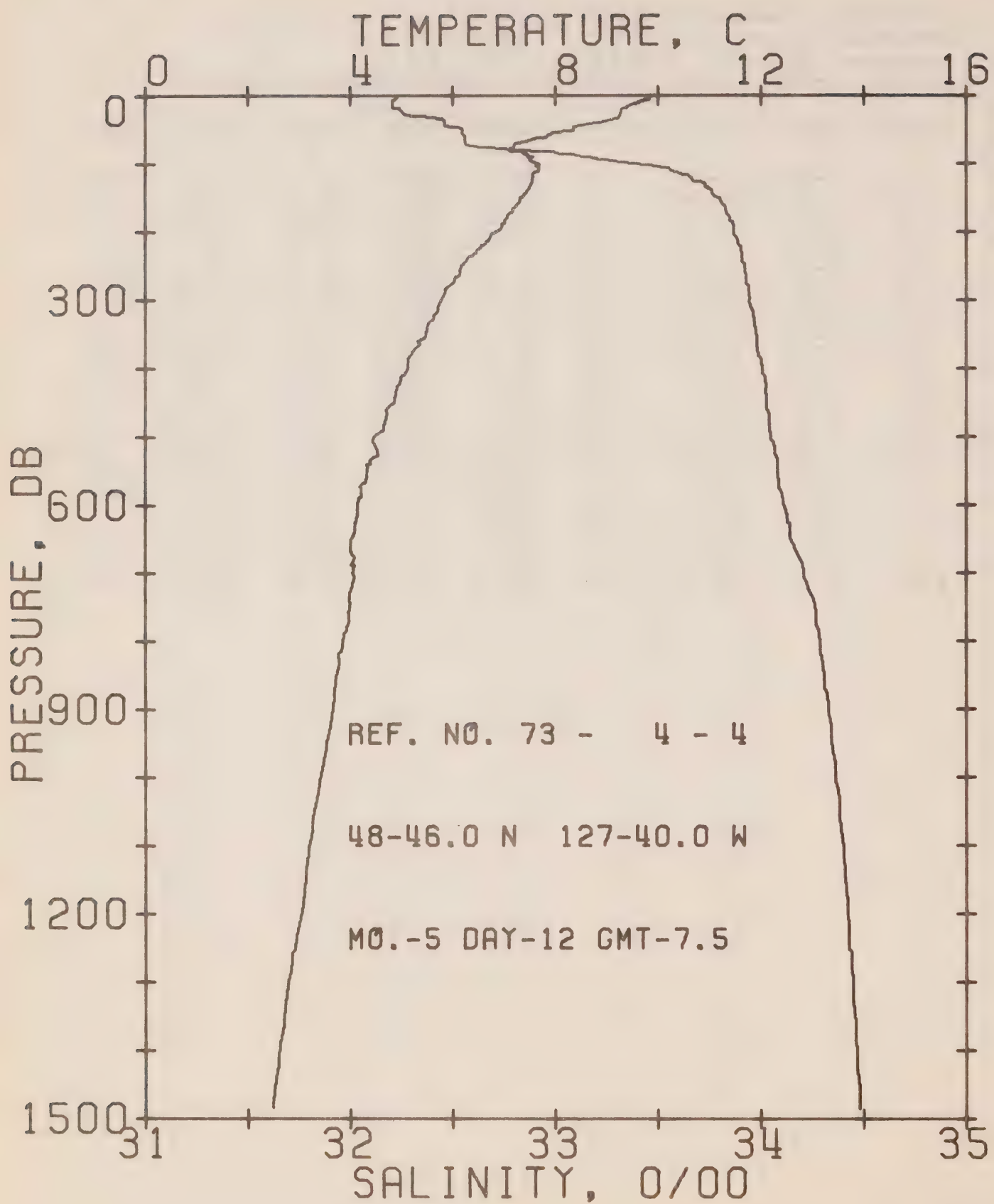
REFERENCE NO. 73- 4- 3

DATE 12/ 5/73

POSITION 48-42.0N, 126-40.0W GMT 3.9

RESULTS OF STP CAST 281 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	9.96	31.89	0	24.56	338.8	0.0	0.0	1486.
10	9.46	31.89	10	24.64	331.5	0.33	0.02	1485.
20	9.21	31.89	20	24.68	327.9	0.66	0.07	1484.
30	8.18	31.98	30	24.90	306.5	0.98	0.15	1480.
50	7.32	32.47	50	25.41	258.3	1.54	0.37	1478.
75	7.25	32.99	75	25.83	219.3	2.14	0.76	1479.
100	7.08	33.53	99	26.27	177.2	2.64	1.20	1479.
125	7.05	33.77	124	26.47	159.3	3.06	1.68	1480.
150	6.78	33.84	149	26.56	150.9	3.45	2.22	1479.
175	6.57	33.87	174	26.61	146.2	3.82	2.84	1479.
200	6.24	33.89	199	26.67	140.9	4.18	3.52	1478.
225	5.87	33.88	223	26.71	137.3	4.53	4.28	1477.
250	5.69	33.88	248	26.73	135.5	4.87	5.10	1476.
300	5.26	33.93	298	26.82	127.0	5.53	6.94	1476.
400	4.68	34.03	397	26.97	113.9	6.71	11.17	1475.
500	4.26	34.09	496	27.06	106.1	7.82	16.22	1475.
600	4.13	34.17	595	27.14	98.9	8.85	21.99	1476.
800	3.64	34.30	793	27.29	85.4	10.69	35.09	1478.
1000	3.25	34.37	991	27.38	77.7	12.32	50.05	1479.



OFFSHORE OCEANOGRAPHY GROUP

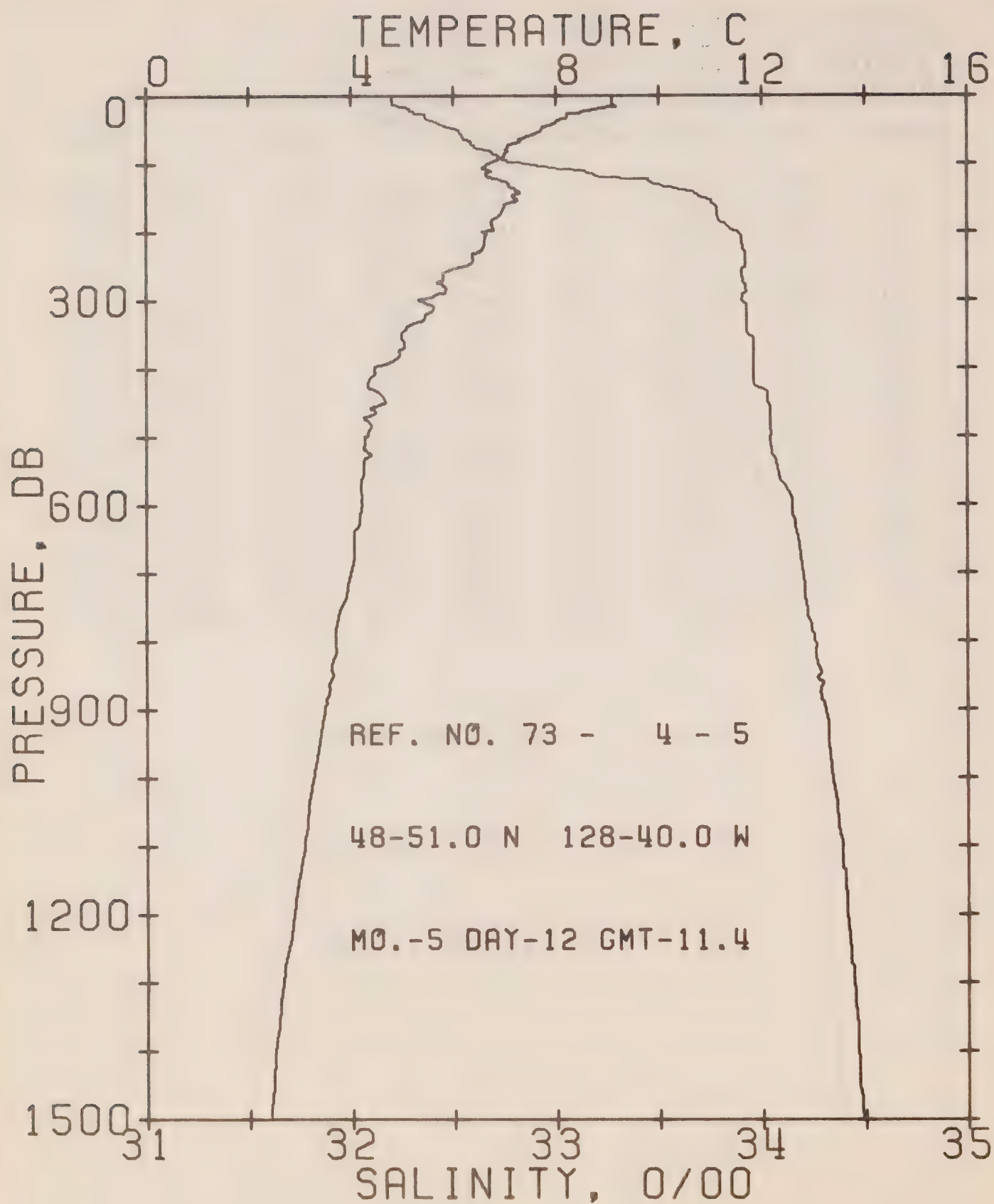
REFERENCE NO. 73- 4- 4

DATE 12/ 5/73

POSITION 48-46.0N, 127-40.0W GMT 7.5

RESULTS OF STP CAST 307 PCINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	9.82	32.23	0	24.85	311.4	0.0	0.0	1486.
10	9.64	32.21	10	24.86	310.5	0.31	0.02	1486.
20	9.28	32.24	20	24.94	303.0	0.62	0.06	1485.
30	9.25	32.32	30	25.01	296.7	0.92	0.14	1485.
50	8.35	32.55	50	25.33	266.8	1.48	0.37	1482.
75	7.16	32.64	75	25.56	244.2	2.12	0.78	1478.
100	7.62	33.36	99	26.07	197.1	2.67	1.26	1481.
125	7.54	33.67	124	26.32	173.3	3.12	1.78	1481.
150	7.36	33.79	149	26.44	162.6	3.54	2.36	1481.
175	7.07	33.94	174	26.52	155.1	3.94	3.02	1481.
200	6.86	33.87	199	26.57	150.5	4.32	3.75	1480.
225	6.52	33.90	223	26.64	144.1	4.69	4.55	1479.
250	6.17	33.92	248	26.70	138.5	5.04	5.40	1478.
300	5.76	33.94	298	26.77	132.2	5.72	7.30	1478.
400	5.11	34.01	397	26.90	120.5	6.98	11.80	1477.
500	4.47	34.05	496	27.01	111.2	8.14	17.12	1476.
600	4.13	34.11	595	27.09	103.7	9.22	23.15	1476.
800	3.86	34.29	793	27.26	89.2	11.15	36.85	1478.
1000	3.41	34.36	991	27.36	80.2	12.84	52.33	1480.
1200	3.03	34.42	1188	27.45	72.5	14.35	69.33	1482.



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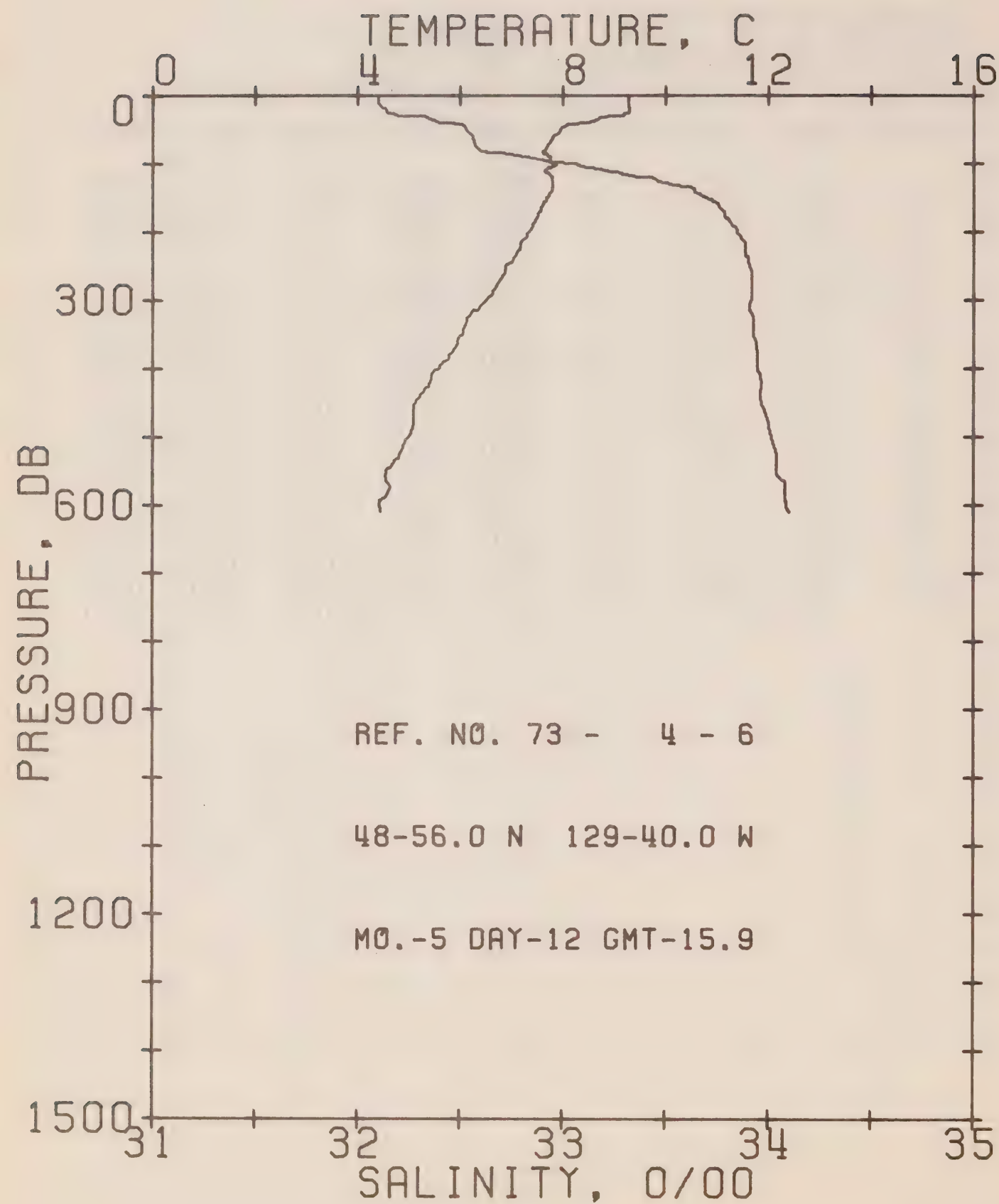
REFERENCE NO. 73- 4- 5

DATE 12/ 5/73

POSITION 48-51.0N, 128-40.0W GMT 11.4

RESULTS OF STP CAST 295 PCINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	9.10	32.20	0	24.94	302.7	0.0	0.0	1483.
10	9.10	32.20	10	24.94	303.0	0.30	0.02	1484.
20	8.79	32.29	20	25.06	292.0	0.60	0.06	1483.
30	8.22	32.36	30	25.20	278.8	0.89	0.13	1481.
50	7.71	32.51	50	25.39	260.5	1.43	0.35	1479.
75	7.07	32.60	75	25.55	246.0	2.06	0.76	1477.
100	6.71	32.83	99	25.78	224.2	2.65	1.28	1477.
125	6.95	33.45	124	26.23	181.8	3.16	1.86	1479.
150	7.16	33.71	149	26.41	165.6	3.60	2.47	1480.
175	6.91	33.78	174	26.49	157.4	4.00	3.14	1480.
200	6.66	33.88	199	26.61	147.0	4.38	3.87	1479.
225	6.56	33.91	223	26.64	143.8	4.74	4.65	1480.
250	6.22	33.92	248	26.70	139.1	5.10	5.51	1479.
300	5.35	33.90	298	26.79	130.1	5.77	7.39	1476.
400	4.46	33.96	397	26.94	116.8	7.02	11.85	1474.
500	4.31	34.04	496	27.02	109.7	8.15	17.02	1475.
600	4.21	34.15	595	27.11	101.6	9.21	22.97	1476.
800	3.69	34.25	793	27.25	90.0	11.13	36.63	1478.
1000	3.24	34.34	991	27.36	79.9	12.82	52.11	1479.
1200	2.95	34.41	1188	27.45	71.5	14.33	68.95	1481.



OFFSHORE OCEANOGRAPHY GROUP

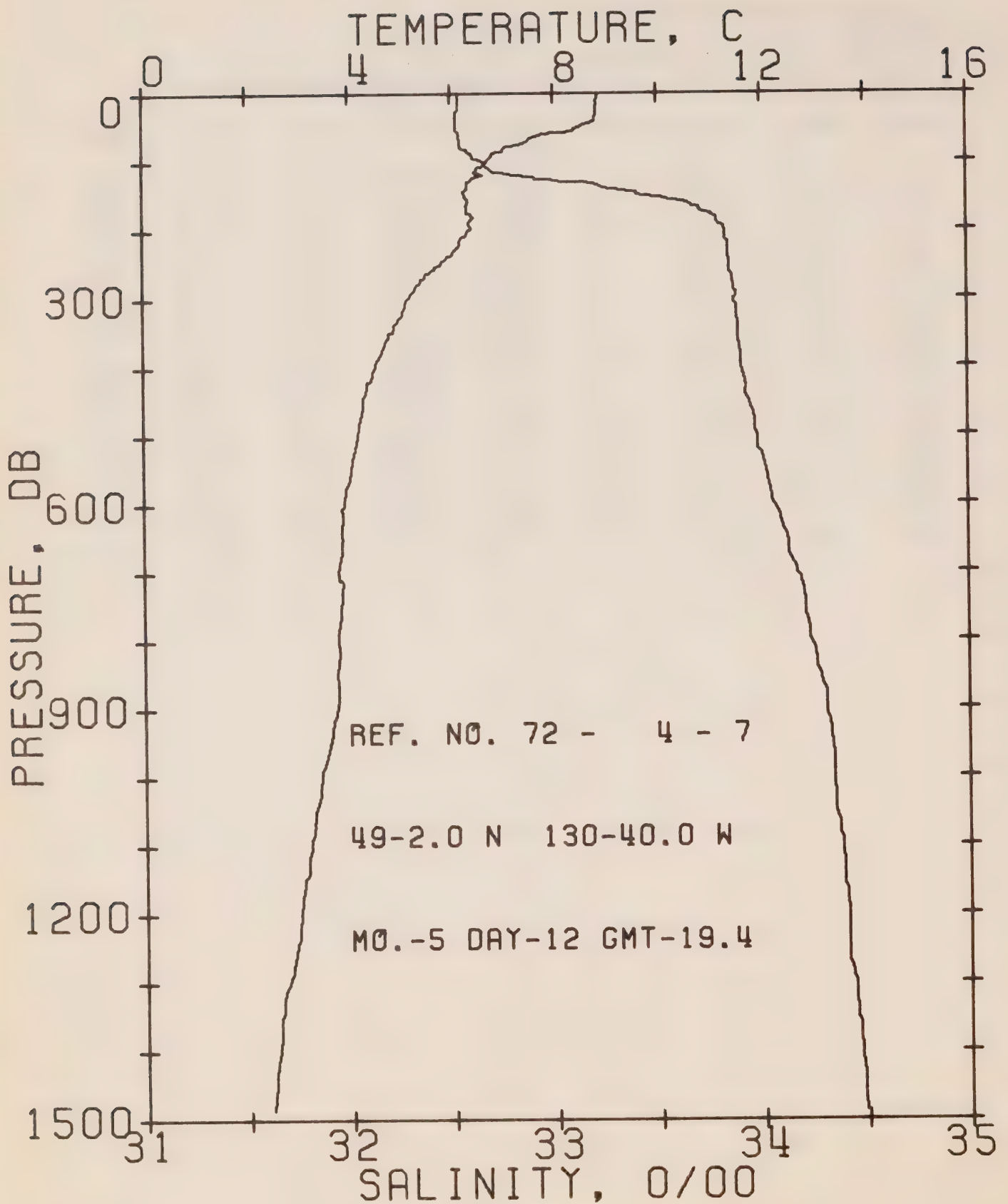
REFERENCE NO. 73- 4- 6

DATE 12/ 5/73

POSITION 48-56.0N, 129-40.0W GMT 15.9

RESULTS OF STP CAST 179 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	9.29	32.10	0	24.83	313.0	0.0	0.0	1484.
10	9.29	32.10	10	24.83	313.3	0.31	0.02	1484.
20	9.31	32.13	20	24.85	311.5	0.63	0.06	1485.
30	9.18	32.20	30	24.92	304.6	0.93	0.14	1484.
50	7.95	32.53	50	25.37	262.9	1.49	0.37	1480.
75	7.69	32.58	75	25.44	255.9	2.14	0.78	1480.
100	7.82	33.03	99	25.78	224.4	2.74	1.32	1481.
125	7.80	33.46	124	26.12	192.6	3.26	1.91	1482.
150	7.70	33.70	149	26.32	173.8	3.72	2.55	1483.
175	7.51	33.79	174	26.42	164.8	4.14	3.25	1482.
200	7.34	33.35	199	26.49	158.5	4.54	4.02	1482.
225	7.16	33.89	223	26.55	153.3	4.93	4.86	1482.
250	6.90	33.91	248	26.60	148.9	5.31	5.78	1481.
300	6.50	33.92	298	26.66	143.6	6.04	7.83	1481.
400	5.59	33.95	397	26.80	130.8	7.41	12.70	1479.
500	4.98	34.01	496	26.92	119.8	8.66	18.42	1478.
600	4.44	34.09	595	27.04	108.8	9.80	24.79	1477.



OFFSHORE OCEANOGRAPHY GROUP

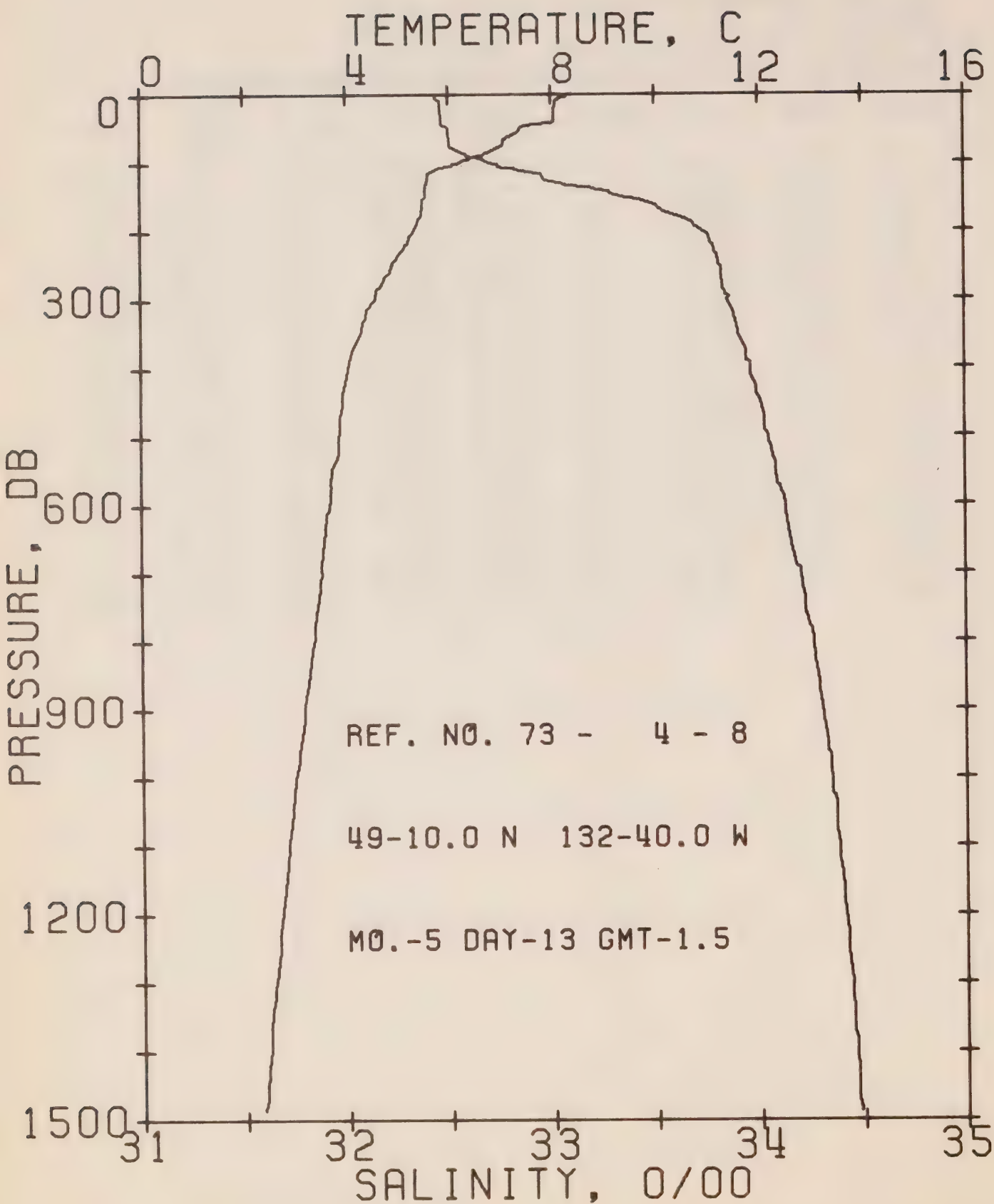
REFERENCE NO. 72- 4- 7

DATE 12/ 5/72

POSITION 49- 2.0N, 130-40.0W GMT 19.4

RESULTS OF STP CAST 326 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.88	32.54	0	25.24	274.2	0.0	0.0	1483.
10	8.84	32.54	10	25.24	274.0	0.27	0.01	1483.
20	8.83	32.54	20	25.24	274.0	0.55	0.06	1483.
30	8.83	32.53	30	25.24	274.9	0.82	0.13	1483.
50	8.47	32.53	50	25.29	270.0	1.37	0.35	1482.
75	7.32	32.55	75	25.47	253.0	2.02	0.76	1478.
100	6.71	32.66	99	25.64	237.2	2.64	1.31	1476.
125	6.41	32.91	124	25.88	215.1	3.21	1.97	1476.
150	6.30	33.43	149	26.30	175.3	3.69	2.63	1477.
175	6.33	33.76	174	26.56	151.4	4.09	3.30	1478.
200	6.37	33.82	199	26.60	147.5	4.46	4.01	1478.
225	6.12	33.84	223	26.65	143.4	4.83	4.80	1478.
250	5.80	33.85	248	26.69	139.1	5.18	5.66	1477.
300	5.15	33.87	298	26.79	130.1	5.85	7.53	1475.
400	4.50	33.90	397	26.89	121.6	7.11	12.01	1474.
500	4.16	33.98	495	26.98	112.9	8.28	17.36	1474.
600	3.89	34.06	595	27.07	105.1	9.37	23.47	1475.
800	3.77	34.23	793	27.22	92.3	11.31	37.30	1478.
1000	3.42	34.34	991	27.34	81.8	13.04	53.14	1480.
1200	2.99	34.41	1188	27.44	73.1	14.59	70.46	1481.



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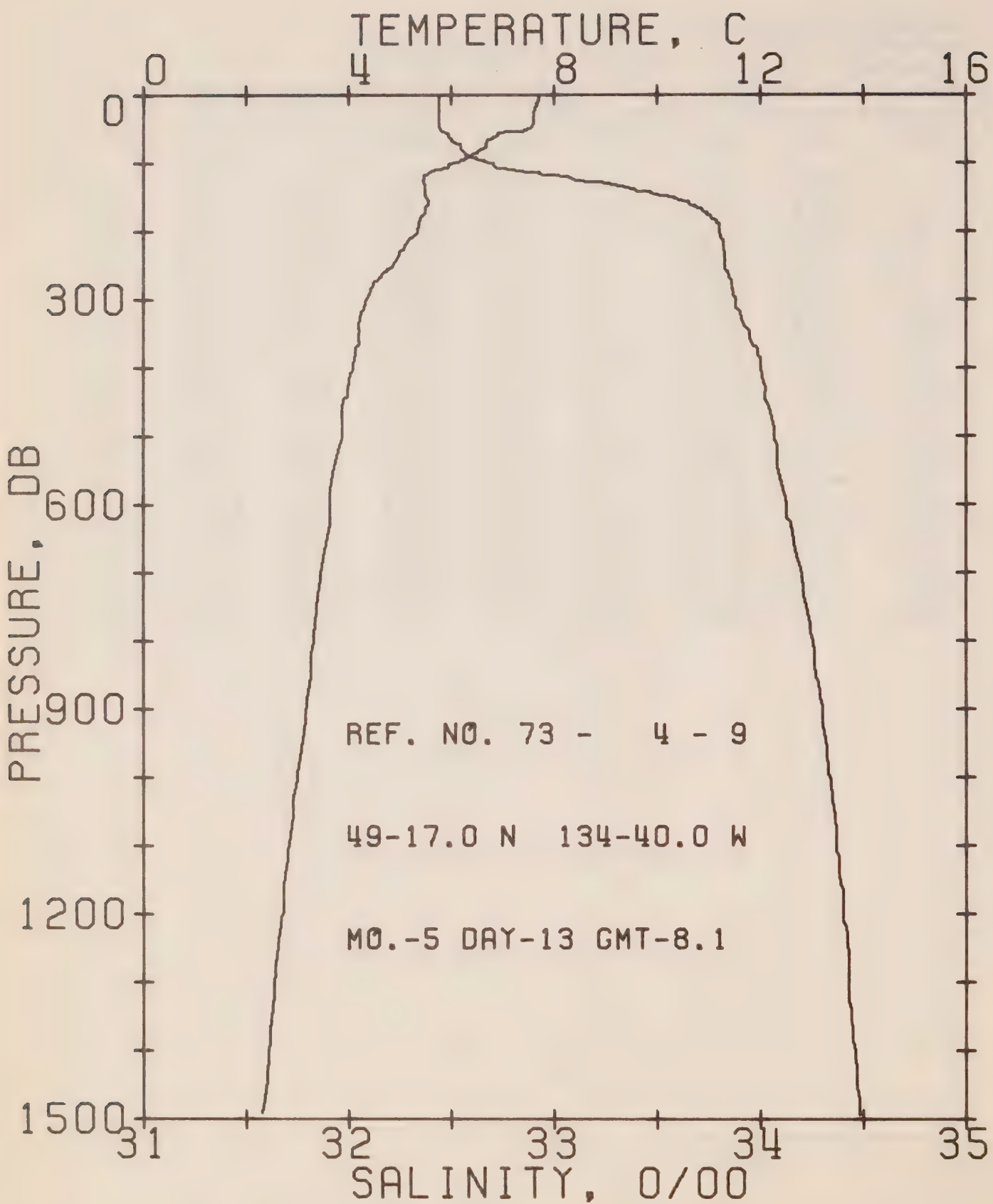
REFERENCE NO. 73- 4- 8

DATE 13/ 5/73

POSITION 49-10.0N, 132-40.0W GMT 1.5

RESULTS OF STP CAST 217 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.39	32.44	0	25.23	274.6	0.0	0.0	1481.
10	8.09	32.46	10	25.29	269.2	0.27	0.01	1480.
20	8.06	32.46	20	25.30	268.9	0.54	0.05	1480.
30	8.05	32.46	30	25.30	268.7	0.81	0.12	1480.
50	7.42	32.50	50	25.42	258.0	1.34	0.34	1478.
75	7.05	32.51	75	25.48	252.5	1.58	0.75	1477.
100	6.25	32.70	99	25.73	228.5	2.58	1.28	1475.
125	5.59	32.97	124	26.02	201.1	3.11	1.89	1473.
150	5.54	33.33	149	26.31	173.6	3.58	2.54	1473.
175	5.46	33.57	174	26.51	155.3	3.98	3.21	1474.
200	5.31	33.73	199	26.66	141.5	4.35	3.91	1474.
225	5.13	33.78	223	26.72	135.9	4.70	4.66	1474.
250	4.91	33.81	248	26.77	131.6	5.03	5.47	1473.
300	4.56	33.85	298	26.84	124.8	5.67	7.27	1473.
400	4.03	33.96	397	26.98	112.2	6.85	11.47	1472.
500	3.84	34.05	496	27.07	104.2	7.93	16.42	1473.
600	3.65	34.13	595	27.15	97.0	8.95	22.08	1474.
800	3.33	34.26	793	27.29	85.3	10.78	35.10	1476.
1000	2.97	34.35	990	27.39	76.1	12.39	49.90	1478.
1200	2.69	34.41	1188	27.47	69.8	13.85	66.24	1480.



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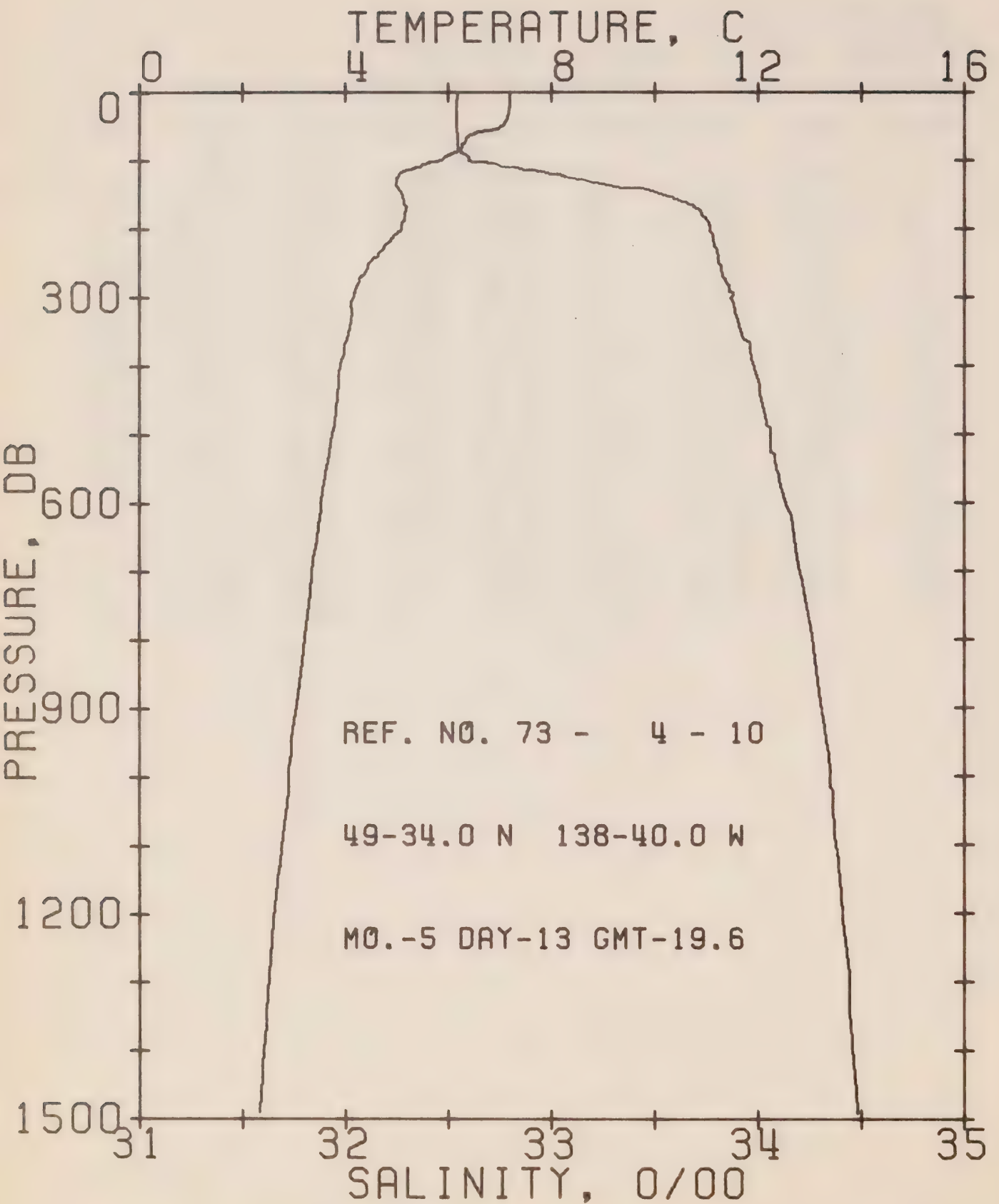
REFERENCE NO. 73- 4- 9

DATE 13/ 5/73

POSITION 49-17.0N, 134-40.0W GMT 8.1

RESULTS OF STP CAST 235 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.71	32.44	0	25.33	265.1	0.0	0.0	1478.
10	7.68	32.44	10	25.34	265.1	0.27	0.01	1479.
20	7.62	32.44	20	25.34	264.4	0.53	0.05	1478.
30	7.60	32.44	30	25.35	264.3	0.79	0.12	1479.
50	7.51	32.45	50	25.37	262.7	1.32	0.34	1479.
75	6.69	32.55	75	25.56	244.9	1.95	0.74	1476.
100	6.14	32.68	99	25.73	228.8	2.55	1.27	1474.
125	5.47	33.11	124	26.15	189.0	3.08	1.87	1472.
150	5.52	33.55	149	26.49	156.6	3.50	2.47	1474.
175	5.45	33.74	174	26.65	142.2	3.87	3.08	1474.
200	5.34	33.80	199	26.71	136.7	4.22	3.74	1474.
225	5.08	33.82	223	26.76	132.5	4.55	4.47	1473.
250	4.85	33.83	248	26.79	129.5	4.88	5.26	1473.
300	4.34	33.88	298	26.89	120.5	5.50	7.00	1472.
400	4.08	34.00	397	27.01	109.6	6.65	11.08	1472.
500	3.86	34.07	496	27.09	102.9	7.71	15.93	1473.
600	3.63	34.13	595	27.16	96.8	8.71	21.53	1474.
800	3.30	34.25	793	27.28	85.7	10.53	34.49	1476.
1000	2.99	34.34	990	27.38	77.3	12.16	49.44	1478.
1200	2.70	34.40	1188	27.46	70.6	13.63	65.88	1480.



OFFSHORE OCEANOGRAPHY GROUP

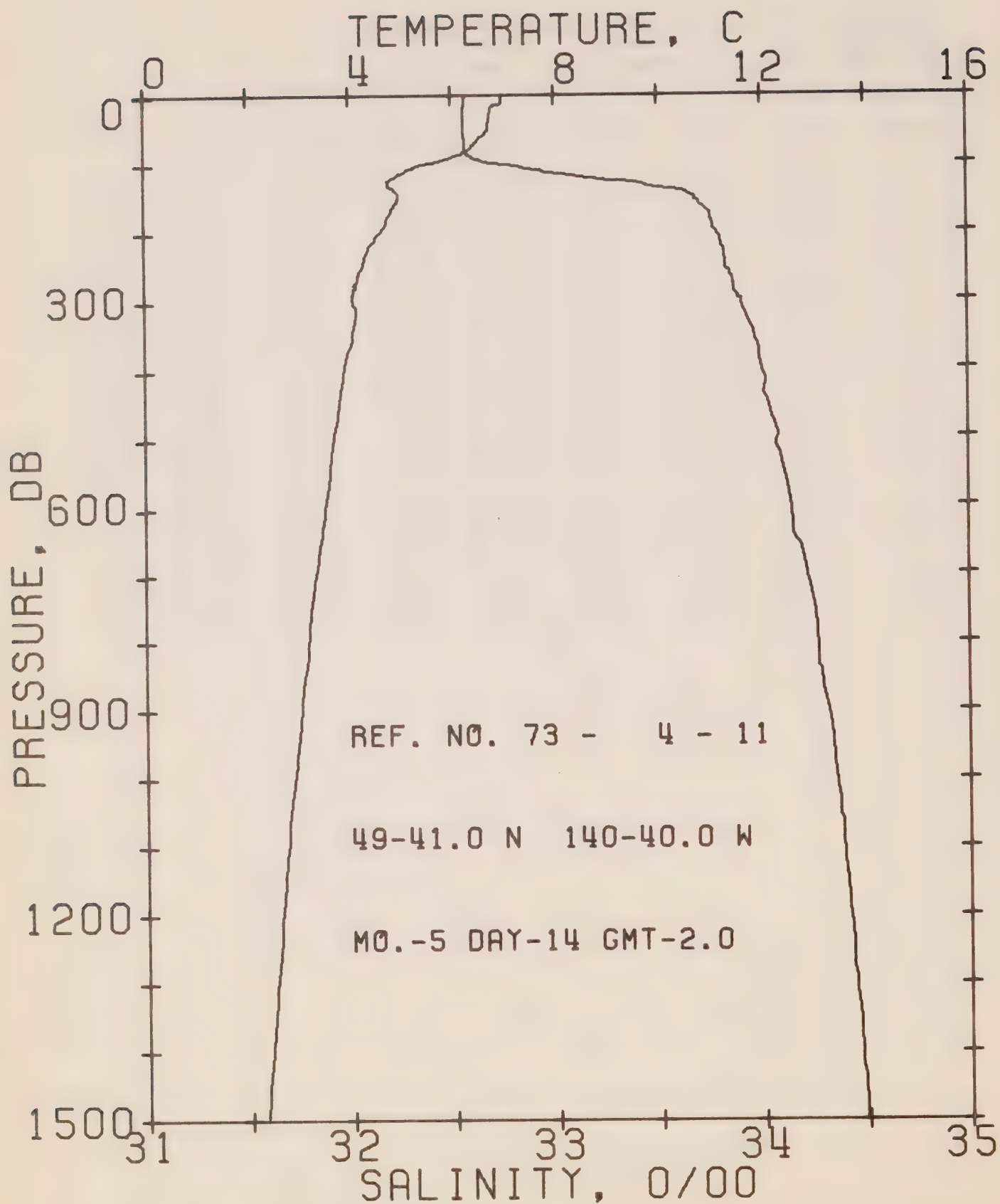
REFERENCE NO. 73- 4- 10

DATE 13/ 5/73

POSITION 49-34.0N, 138-40.0W GMT 19.6

RESULTS OF STP CAST 178 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.20	32.55	0	25.49	250.3	0.0	0.0	1477.
10	7.20	32.55	10	25.49	250.9	0.25	0.01	1477.
20	7.20	32.54	20	25.48	251.4	0.50	0.05	1477.
30	7.16	32.54	30	25.49	251.1	0.75	0.12	1477.
50	7.05	32.54	50	25.50	249.9	1.25	0.32	1477.
75	6.30	32.55	75	25.61	240.1	1.86	0.71	1474.
100	5.33	32.60	99	25.70	231.7	2.45	1.23	1473.
125	5.00	33.08	124	26.18	186.0	2.97	1.83	1470.
150	5.12	33.53	149	26.52	153.6	3.39	2.41	1472.
175	5.16	33.72	174	26.67	140.4	3.76	3.01	1473.
200	5.10	33.77	199	26.71	136.2	4.10	3.67	1473.
225	4.76	33.79	223	26.77	131.2	4.44	4.40	1472.
250	4.47	33.81	248	26.82	126.7	4.76	5.18	1471.
300	4.17	33.87	293	26.90	119.5	5.37	6.89	1471.
400	3.90	33.98	397	27.01	109.2	6.52	10.97	1472.
500	3.73	34.06	496	27.09	102.3	7.59	15.82	1473.
600	3.52	34.13	595	27.17	95.4	8.57	21.38	1473.
800	3.19	34.26	793	27.30	83.6	10.35	34.06	1476.
1000	2.88	34.35	990	27.40	75.1	11.94	48.57	1478.
1200	2.61	34.41	1188	27.47	69.1	13.33	64.73	1480.



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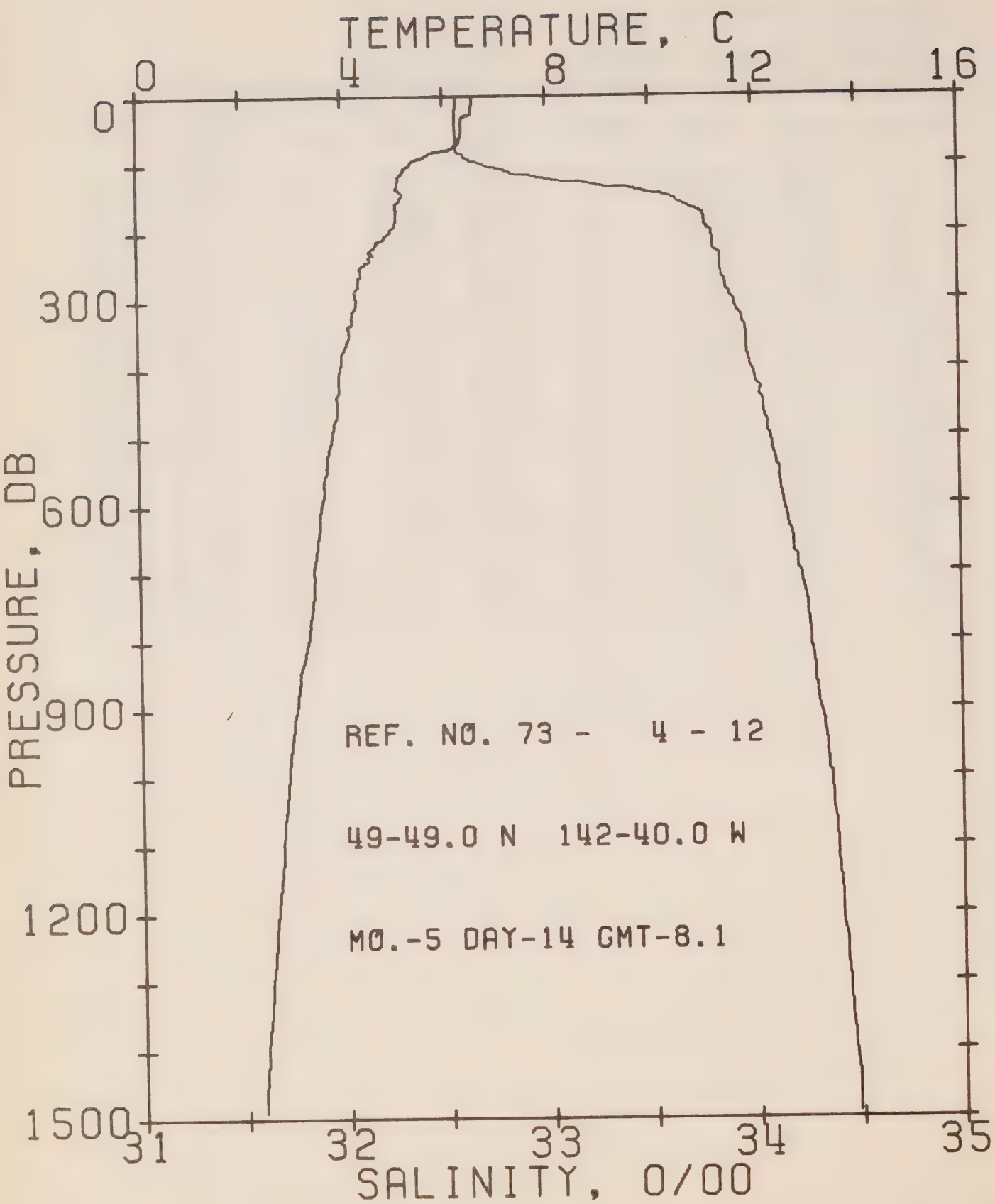
REFERENCE NO. 73- 4- 11

DATE 14/ 5/73

POSITION 49-41.0N, 140-40.0W GMT 2.0

RESULTS OF STP CAST 197 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.98	32.58	0	25.54	245.2	0.0	0.0	1476.
10	6.98	32.57	10	25.53	246.2	0.25	0.01	1476.
20	6.77	32.56	20	25.55	244.5	0.49	0.05	1475.
30	6.75	32.56	30	25.56	244.3	0.74	0.11	1475.
50	6.72	32.56	50	25.56	244.2	1.22	0.31	1476.
75	6.39	32.57	75	25.61	239.7	1.83	0.70	1475.
100	5.66	32.68	99	25.79	223.1	2.42	1.22	1472.
125	4.79	33.24	124	26.33	171.5	2.91	1.78	1470.
150	4.95	33.68	149	26.66	140.7	3.29	2.31	1471.
175	4.79	33.75	174	26.73	134.0	3.63	2.88	1471.
200	4.61	33.78	199	26.78	130.0	3.96	3.51	1471.
225	4.38	33.82	223	26.83	125.0	4.28	4.20	1471.
250	4.26	33.83	248	26.85	123.0	4.59	4.95	1470.
300	4.06	33.91	298	26.94	115.6	5.18	6.62	1471.
400	3.90	34.00	397	27.03	107.7	6.30	10.60	1472.
500	3.67	34.08	496	27.11	100.2	7.35	15.38	1472.
600	3.51	34.14	595	27.17	95.0	8.33	20.86	1473.
800	3.16	34.27	793	27.31	83.0	10.09	33.44	1475.
1000	2.87	34.35	990	27.40	74.7	11.67	47.87	1478.
1200	2.61	34.41	1188	27.48	68.5	13.10	63.84	1480.



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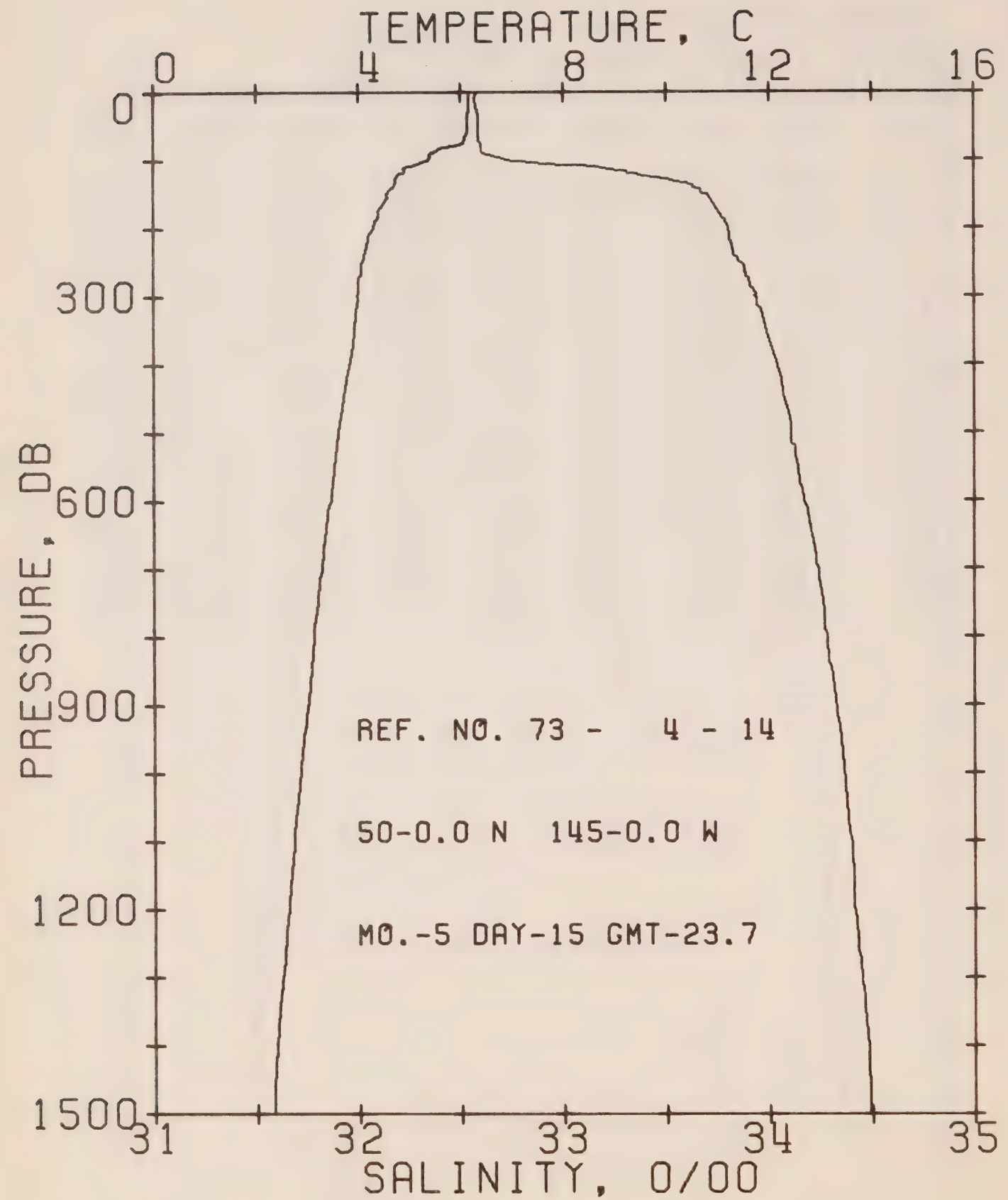
REFERENCE NO. 73- 4- 12

DATE 14/ 5/73

POSITION 49-49.0N, 142-40.0W GMT 8.1

RESULTS OF STP CAST 221 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.59	32.57	0	25.59	241.0	0.0	0.0	1474.
10	6.58	32.57	10	25.59	241.2	0.24	0.01	1474.
20	6.57	32.56	20	25.58	242.0	0.48	0.05	1474.
30	6.44	32.56	30	25.60	240.5	0.72	0.11	1474.
50	6.36	32.56	50	25.61	239.8	1.20	0.31	1474.
75	6.21	32.57	75	25.63	237.4	1.80	0.69	1474.
100	5.35	32.69	99	25.83	218.8	2.38	1.20	1471.
125	5.10	33.06	124	26.16	188.2	2.89	1.79	1471.
150	5.17	33.61	149	26.58	148.3	3.30	2.36	1472.
175	5.08	33.76	174	26.71	136.3	3.65	2.94	1473.
200	4.95	33.80	199	26.75	132.3	3.99	3.59	1472.
225	4.58	33.81	223	26.80	127.6	4.32	4.29	1471.
250	4.39	33.84	248	26.85	123.6	4.63	5.05	1471.
300	4.28	33.90	298	26.91	118.2	5.24	6.75	1471.
400	3.95	33.99	397	27.01	109.3	6.36	10.77	1472.
500	3.78	34.08	496	27.10	101.3	7.41	15.57	1473.
600	3.55	34.14	595	27.17	95.0	8.39	21.06	1474.
800	3.24	34.27	793	27.30	83.6	10.17	33.68	1476.
1000	2.85	34.36	990	27.41	73.9	11.74	48.08	1477.
1200	2.61	34.41	1188	27.47	68.8	13.16	64.03	1480.



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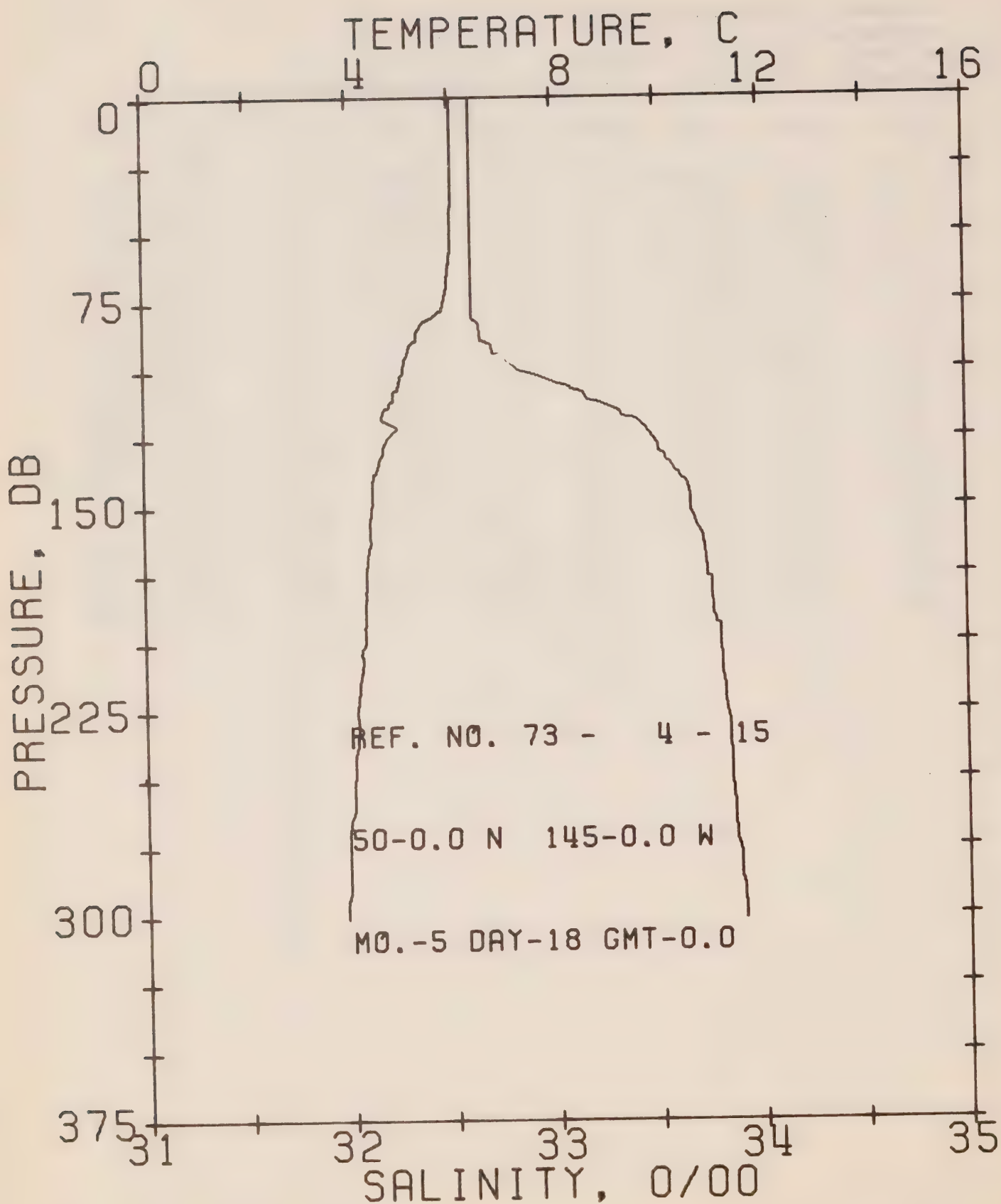
REFERENCE NO. 73- 4- 14

DATE 15/ 5/73

POSITION 50- 0.0N, 145- 0.0W GMT 23.7

RESULTS OF STD CAST 166 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.16	32.58	0	25.65	235.1	0.0	0.0	1473.
10	6.16	32.57	10	25.64	236.1	0.24	0.01	1473.
20	6.16	32.57	20	25.64	235.9	0.47	0.05	1473.
30	6.15	32.58	30	25.65	235.5	0.71	0.11	1473.
50	6.13	32.59	50	25.66	234.8	1.18	0.30	1473.
75	6.04	32.60	75	25.68	233.4	1.76	0.67	1473.
100	5.36	32.73	99	25.86	215.9	2.33	1.18	1471.
125	4.74	33.41	124	26.47	158.2	2.79	1.70	1470.
150	4.56	33.68	149	26.70	136.5	3.15	2.20	1470.
175	4.38	33.75	174	26.78	129.6	3.48	2.75	1470.
200	4.29	33.80	199	26.83	125.1	3.80	3.36	1470.
225	4.17	33.82	223	26.86	122.6	4.11	4.03	1470.
250	4.06	33.85	244	26.89	119.1	4.41	4.76	1470.
300	3.98	33.93	298	26.96	113.0	4.99	6.38	1470.
400	3.82	34.04	397	27.06	104.2	6.07	10.25	1471.
500	3.60	34.11	496	27.14	97.2	7.08	14.84	1472.
600	3.46	34.17	595	27.21	92.0	8.02	20.15	1473.
800	3.12	34.28	793	27.32	81.6	9.74	32.39	1475.
1000	2.85	34.36	990	27.42	73.7	11.30	46.60	1477.
1200	2.61	34.41	1188	27.48	68.6	12.71	62.43	1480.



OFFSHORE OCEANOGRAPHY GROUP

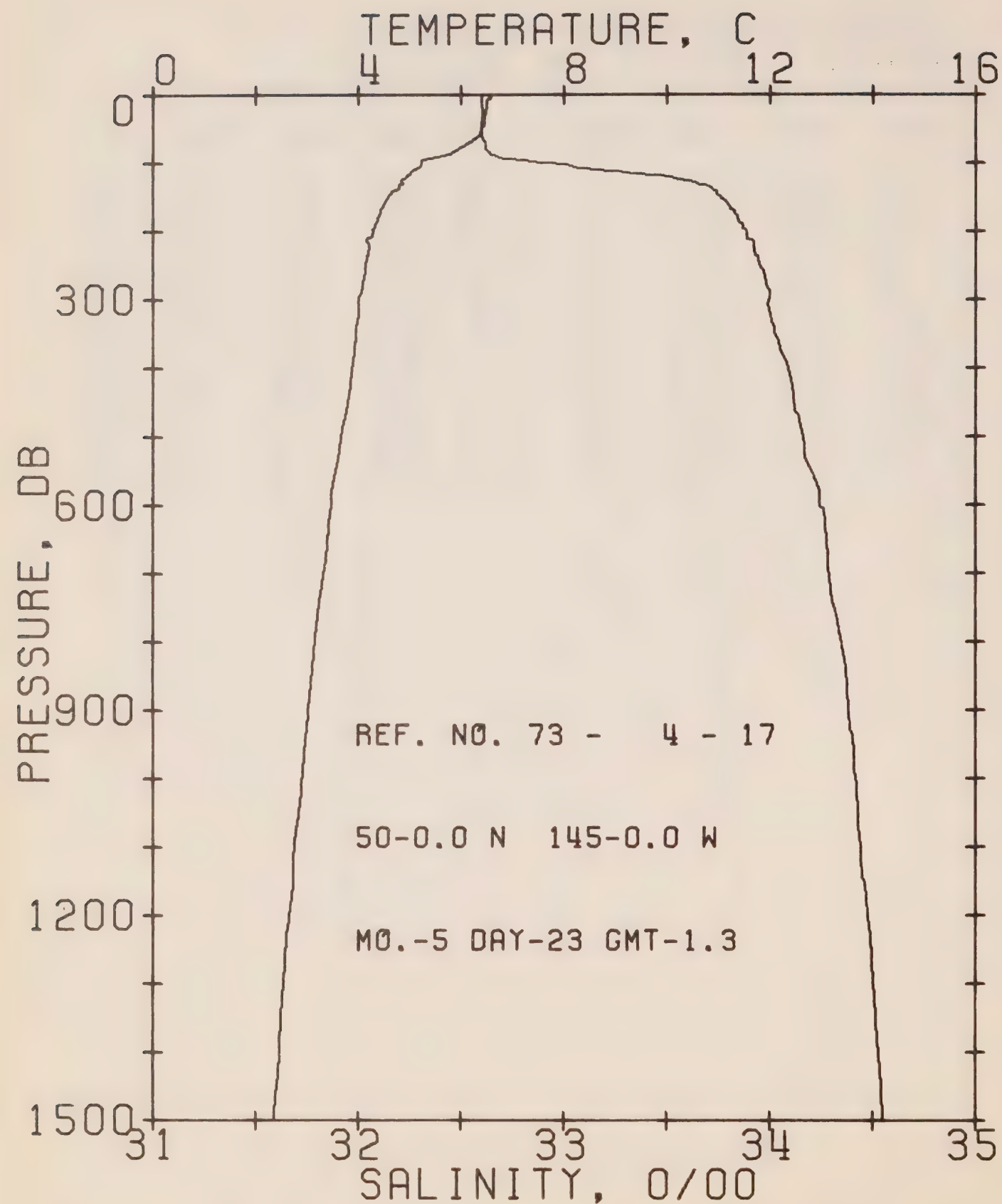
REFERENCE NO. 73- 4- 15

DATE 18/ 5/73

POSITION 50- 0.0N, 145- 0.0W GMT 0.0

RESULTS OF STP CAST 114 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.05	32.61	0	25.69	231.6	0.0	0.0	1472.
10	6.05	32.61	10	25.69	231.8	0.23	0.01	1472.
20	6.04	32.61	20	25.69	231.9	0.46	0.05	1472.
30	6.04	32.61	30	25.69	232.0	0.70	0.11	1473.
50	6.02	32.61	50	25.69	232.0	1.16	0.30	1473.
75	5.87	32.61	75	25.71	230.5	1.74	0.66	1473.
100	5.07	32.83	99	25.97	205.3	2.29	1.15	1470.
125	4.74	33.48	124	26.53	153.2	2.72	1.65	1470.
150	4.43	33.66	149	26.70	136.6	3.08	2.15	1469.
175	4.32	33.74	174	26.78	129.7	3.41	2.70	1469.
200	4.29	33.80	199	26.83	125.1	3.73	3.30	1470.
225	4.11	33.83	223	26.87	121.3	4.04	3.97	1469.
250	4.02	33.85	248	26.89	119.0	4.34	4.70	1469.
300	3.88	33.91	298	26.96	113.4	4.92	6.32	1470.



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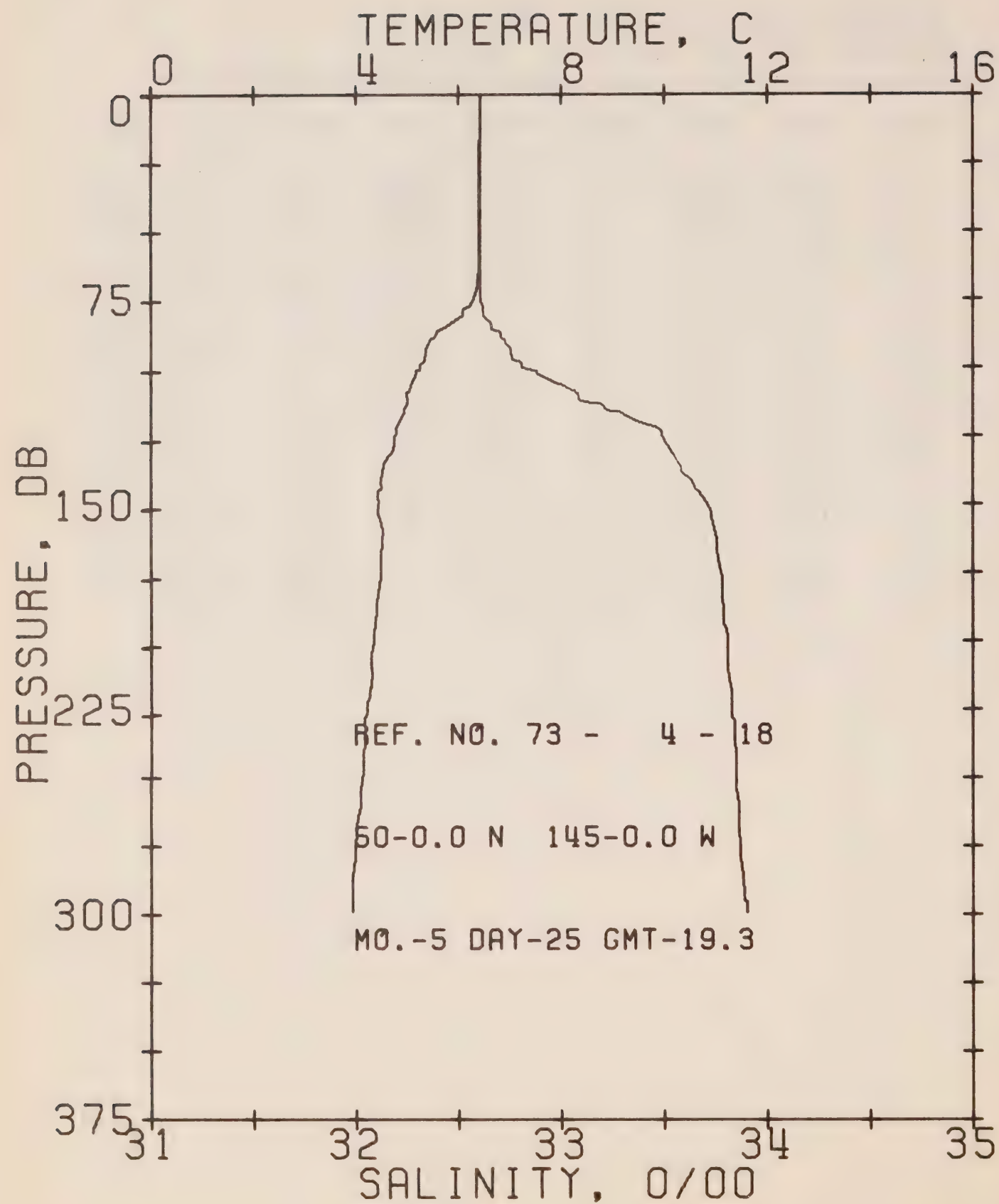
REFERENCE NO. 73- 4- 17

DATE 23/ 5/73

POSITION 50- 0.0N, 145- 0.0W GMT 1.3

RESULTS OF STP CAST 162 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.59	32.61	0	25.62	238.0	0.0	0.0	1474.
10	6.52	32.60	10	25.62	238.3	0.24	0.01	1474.
20	6.49	32.60	20	25.63	237.7	0.48	0.05	1474.
30	6.46	32.61	30	25.63	237.0	0.71	0.11	1474.
50	6.39	32.60	50	25.63	237.2	1.19	0.30	1474.
75	6.05	32.62	75	25.69	231.8	1.78	0.68	1473.
100	5.22	32.88	99	26.00	202.9	2.33	1.17	1471.
125	4.85	33.58	124	26.59	146.9	2.77	1.67	1471.
150	4.59	33.75	149	26.76	131.3	3.11	2.15	1470.
175	4.41	33.43	174	26.84	123.6	3.43	2.68	1470.
200	4.29	33.39	199	26.90	118.3	3.73	3.25	1470.
225	4.21	33.92	223	26.93	115.5	4.03	3.39	1470.
250	4.12	33.95	248	26.96	112.6	4.31	4.58	1470.
300	4.01	34.00	293	27.01	108.1	4.86	6.12	1470.
400	3.39	34.09	397	27.10	101.1	5.92	9.88	1472.
500	3.66	34.16	496	27.18	94.1	6.90	14.36	1472.
600	3.47	34.24	555	27.26	86.9	7.80	19.41	1473.
800	3.15	34.34	793	27.37	77.1	9.44	31.09	1475.
1000	2.90	34.42	990	27.45	70.4	10.91	44.54	1478.
1200	2.64	34.47	1188	27.52	64.5	12.26	59.69	1480.



OFFSHORE OCEANOGRAPHY GROUP

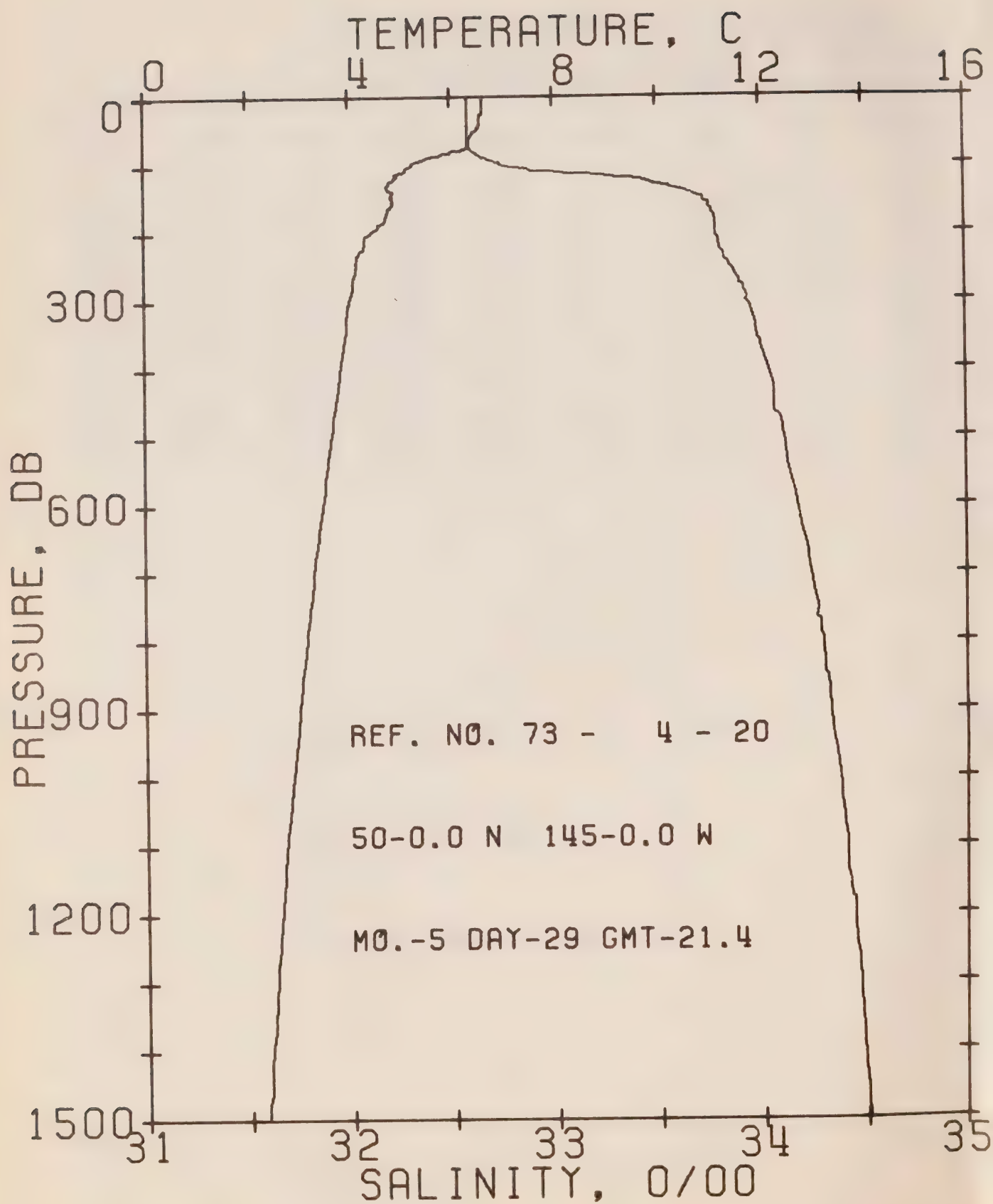
REFERENCE NO. 73- 4- 18

DATE 25/ 5/73

POSITION 50- 0.0N, 145- 0.0W GMT 19.3

RESULTS OF STP CAST 105 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.42	32.61	0	25.64	235.9	0.0	0.0	1474.
10	6.42	32.61	10	25.64	236.3	0.24	0.01	1474.
20	6.41	32.61	20	25.64	236.4	0.47	0.05	1474.
30	6.41	32.61	30	25.64	236.4	0.71	0.11	1474.
50	6.40	32.61	50	25.64	236.5	1.18	0.30	1474.
75	6.28	32.61	75	25.66	235.4	1.77	0.68	1474.
100	5.26	32.81	99	25.94	208.8	2.33	1.17	1471.
125	4.75	33.49	124	26.53	152.6	2.78	1.68	1470.
150	4.43	33.71	149	26.74	132.9	3.13	2.18	1469.
175	4.47	33.77	174	26.79	128.6	3.46	2.72	1470.
200	4.34	33.81	199	26.83	124.8	3.78	3.33	1470.
225	4.21	33.83	223	26.86	122.3	4.09	4.00	1470.
250	4.10	33.85	248	26.89	119.8	4.39	4.73	1470.



OFFSHORE OCEANOGRAPHY GROUP

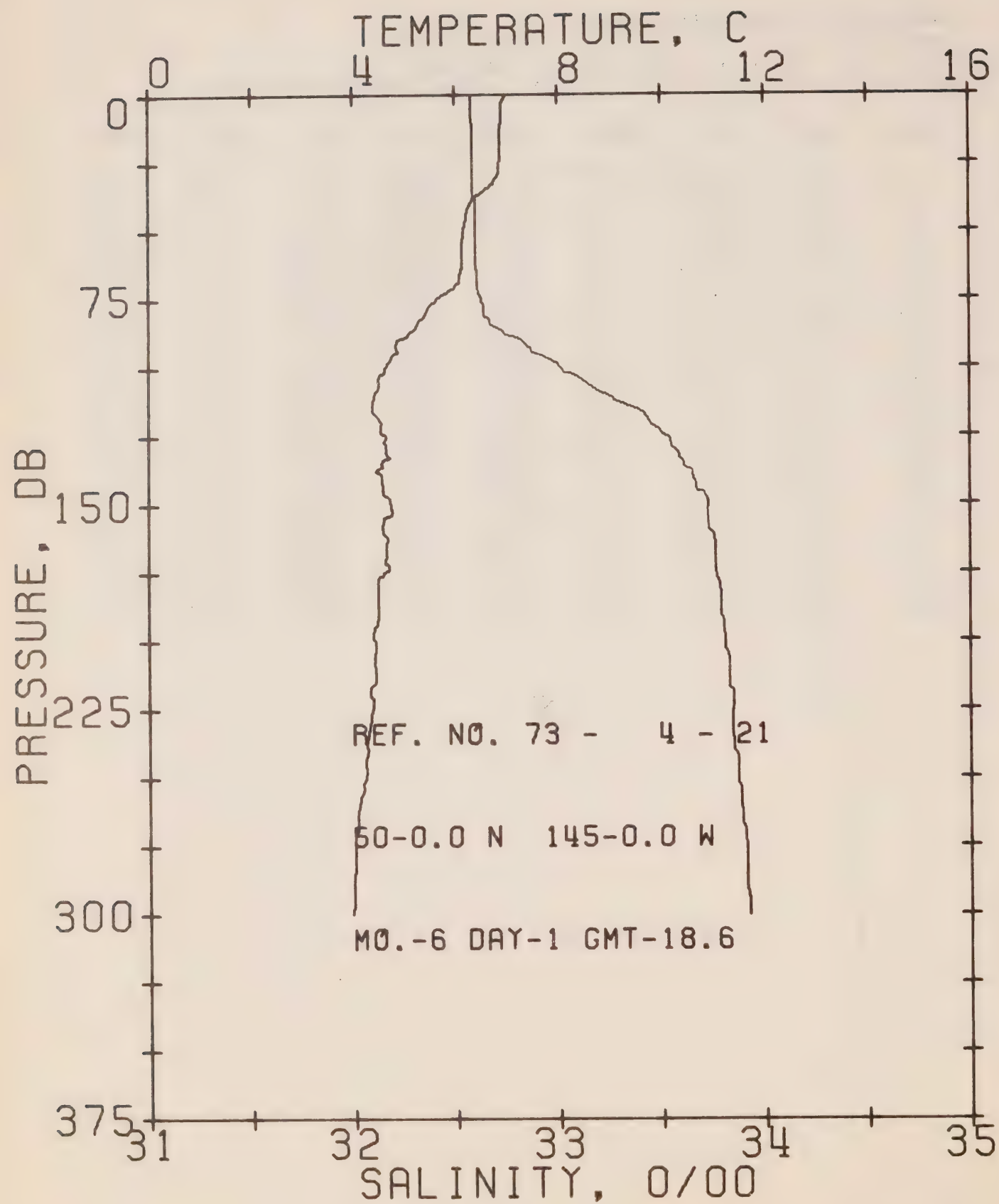
REFERENCE NO. 73- 4- 20

DATE 29/ 5/73

POSITION 50- 0.0N, 145- 0.0W GMT 21.4

RESULTS OF STP CAST 217 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.65	32.58	0	25.59	241.0	0.0	0.0	1474.
10	6.64	32.59	10	25.59	240.5	0.24	0.01	1475.
20	6.64	32.59	20	25.59	240.6	0.48	0.05	1475.
30	6.60	32.59	30	25.60	240.2	0.72	0.11	1475.
50	6.51	32.59	50	25.61	239.4	1.20	0.31	1475.
75	6.34	32.59	75	25.63	237.7	1.80	0.69	1474.
100	5.25	32.74	99	25.88	214.0	2.36	1.19	1471.
125	4.82	33.45	124	26.49	156.3	2.83	1.72	1470.
150	4.35	33.73	149	26.71	135.9	3.19	2.23	1471.
175	4.75	33.78	174	26.76	131.6	3.53	2.78	1471.
200	4.45	33.79	199	26.80	127.6	3.85	3.40	1470.
225	4.27	33.81	223	26.84	124.4	4.17	4.08	1470.
250	4.15	33.86	248	26.89	119.9	4.47	4.82	1470.
300	4.01	33.93	298	26.96	113.3	5.05	6.44	1470.
400	3.83	34.04	397	27.06	104.1	6.13	10.30	1471.
500	3.65	34.11	496	27.14	97.4	7.14	14.91	1472.
600	3.47	34.17	595	27.21	91.7	8.09	20.22	1473.
800	3.14	34.30	793	27.34	80.3	9.80	32.41	1475.
1000	2.85	34.37	990	27.42	72.9	11.34	46.46	1478.
1200	2.61	34.44	1188	27.50	66.6	12.73	62.09	1480.



OFFSHORE OCEANOGRAPHY GROUP

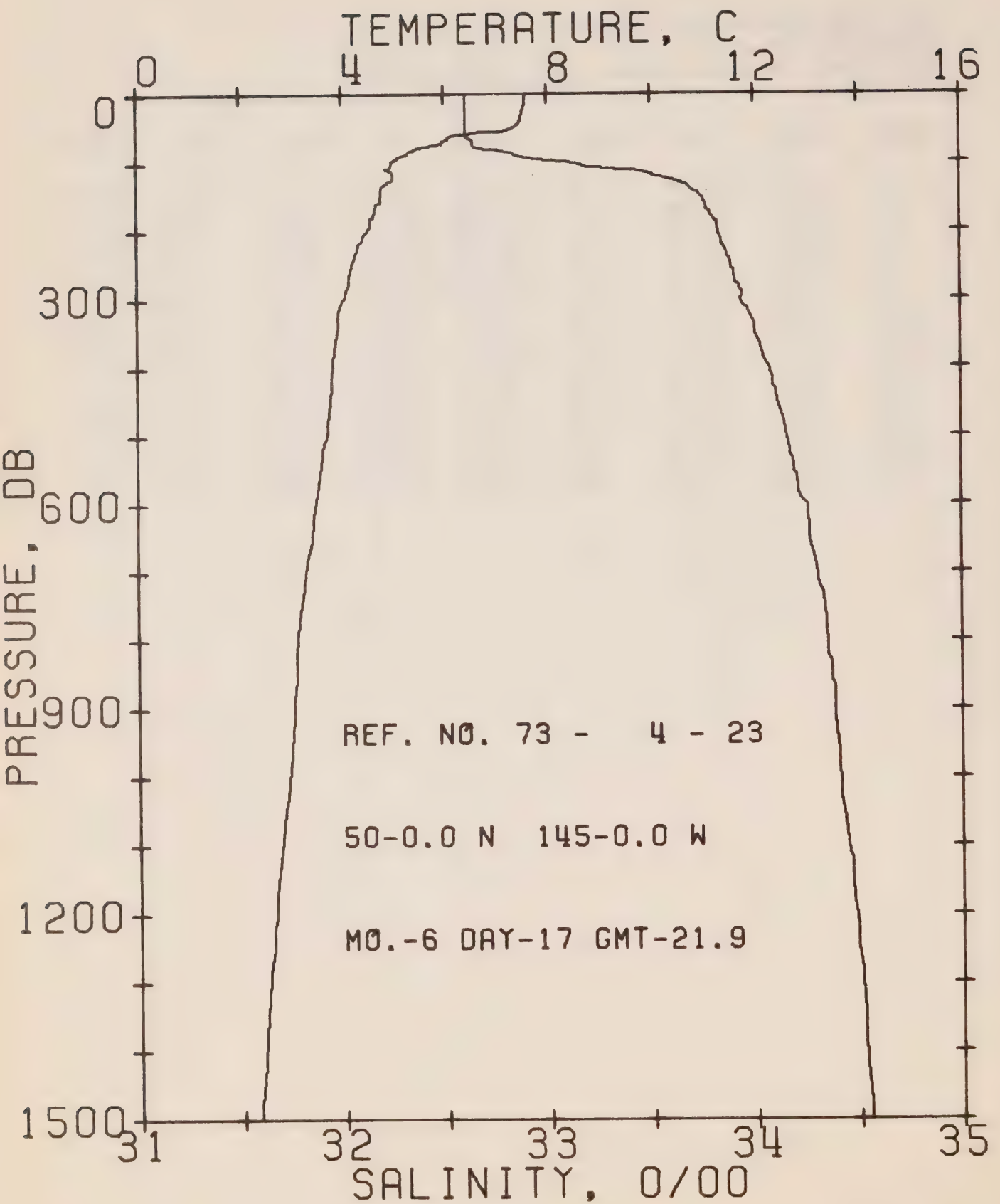
REFERENCE NO. 73- 4- 21

DATE 1/ 6/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.6

RESULTS OF STP CAST 171 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.98	32.58	0	25.54	245.2	0.0	0.0	1476.
10	6.90	32.58	10	25.56	244.1	0.24	0.01	1476.
20	6.87	32.59	20	25.56	243.5	0.49	0.05	1476.
30	6.82	32.59	30	25.57	243.0	0.73	0.11	1476.
50	6.17	32.60	50	25.66	234.5	1.21	0.31	1473.
75	5.62	32.63	75	25.75	226.1	1.79	0.68	1472.
100	4.62	33.01	99	26.17	187.0	2.31	1.14	1468.
125	4.65	33.53	124	26.57	148.5	2.72	1.61	1470.
150	4.74	33.73	149	26.72	134.6	3.08	2.10	1471.
175	4.61	33.76	174	26.76	131.2	3.41	2.65	1471.
200	4.44	33.81	199	26.82	126.0	3.73	3.26	1470.
225	4.35	33.85	223	26.86	122.5	4.04	3.93	1470.
250	4.22	33.87	248	26.89	119.6	4.34	4.66	1470.
300	3.95	33.92	298	26.96	113.4	4.92	6.28	1470.



OFFSHORE OCEANOGRAPHY GROUP

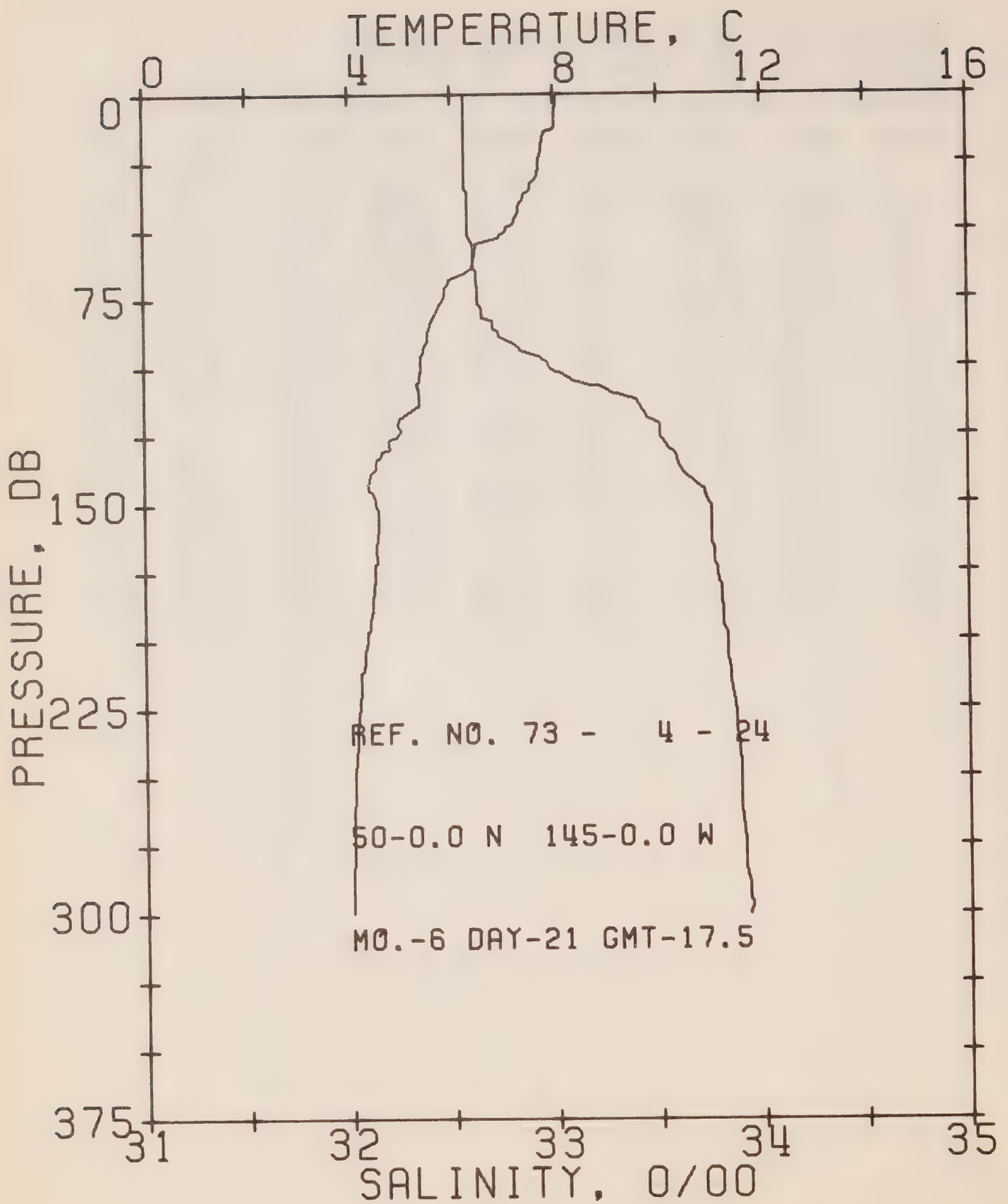
REFERENCE NO. 73- 4- 23

DATE 17/ 6/73

POSITION 50- 0.0N, 145- 0.0W GMT 21.9

RESULTS OF STP CAST 179 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.59	32.61	0	25.48	250.9	0.0	0.0	1479.
10	7.56	32.61	10	25.49	250.9	0.25	0.01	1478.
20	7.55	32.61	20	25.49	250.8	0.50	0.05	1478.
30	7.51	32.61	30	25.49	250.4	0.75	0.11	1478.
50	7.36	32.61	50	25.51	248.7	1.25	0.32	1478.
75	5.82	32.64	75	25.74	227.7	1.84	0.69	1472.
100	4.98	33.08	99	26.18	185.5	2.36	1.15	1470.
125	5.00	33.59	124	26.58	148.2	2.78	1.63	1471.
150	4.77	33.74	149	26.73	134.4	3.12	2.11	1471.
175	4.63	33.79	174	26.78	129.3	3.45	2.66	1471.
200	4.49	33.82	199	26.83	125.4	3.77	3.27	1471.
225	4.31	33.85	223	26.87	121.5	4.08	3.94	1470.
250	4.19	33.89	248	26.91	117.7	4.38	4.66	1470.
300	4.03	33.93	298	26.96	113.6	4.96	6.28	1470.
400	3.81	34.07	397	27.09	101.4	6.03	10.08	1471.
500	3.68	34.15	496	27.17	94.9	7.01	14.58	1473.
600	3.46	34.24	595	27.26	86.4	7.92	19.68	1473.
800	3.09	34.35	793	27.38	76.4	9.54	31.21	1475.
1000	2.91	34.41	990	27.44	71.3	11.01	44.71	1478.
1200	2.63	34.48	1188	27.53	64.0	12.36	59.82	1480.



OFFSHORE OCEANOGRAPHY GROUP

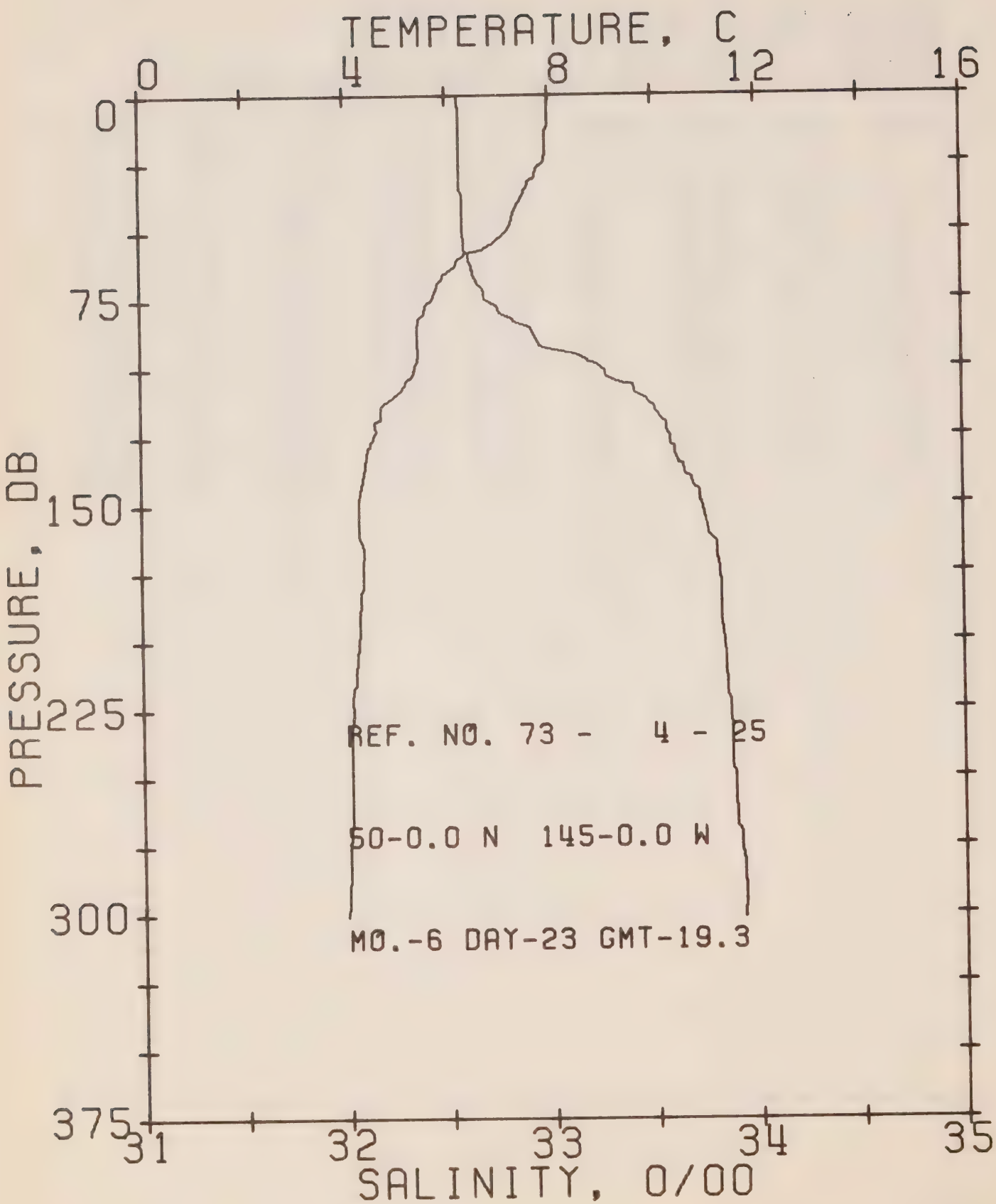
REFERENCE NO. 73- 4- 24

DATE 21/ 6/73

POSITION 50- 0.0N, 145- 0.0W GMT 17.5

RESULTS OF STP CAST 153 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.05	32.57	0	25.38	260.1	0.0	0.0	1480.
10	8.02	32.57	10	25.39	260.1	0.26	0.01	1480.
20	7.76	32.57	20	25.43	256.7	0.52	0.05	1479.
30	7.67	32.57	30	25.44	255.6	0.77	0.12	1479.
50	7.07	32.58	50	25.53	247.1	1.28	0.32	1477.
75	5.84	32.63	75	25.73	228.6	1.87	0.70	1473.
100	5.38	32.77	99	26.05	198.2	2.41	1.18	1471.
125	4.94	33.51	124	26.53	153.1	2.83	1.66	1471.
150	4.50	33.74	149	26.76	131.4	3.18	2.16	1470.
175	4.49	33.78	174	26.79	128.5	3.51	2.70	1470.
200	4.32	33.83	199	26.85	123.2	3.83	3.30	1470.
225	4.15	33.86	223	26.89	119.4	4.13	3.95	1470.
250	4.06	33.89	248	26.92	116.4	4.42	4.67	1470.
300	3.99	33.93	298	26.96	113.1	5.00	5.27	1470.



OFFSHORE OCEANOGRAPHY GROUP

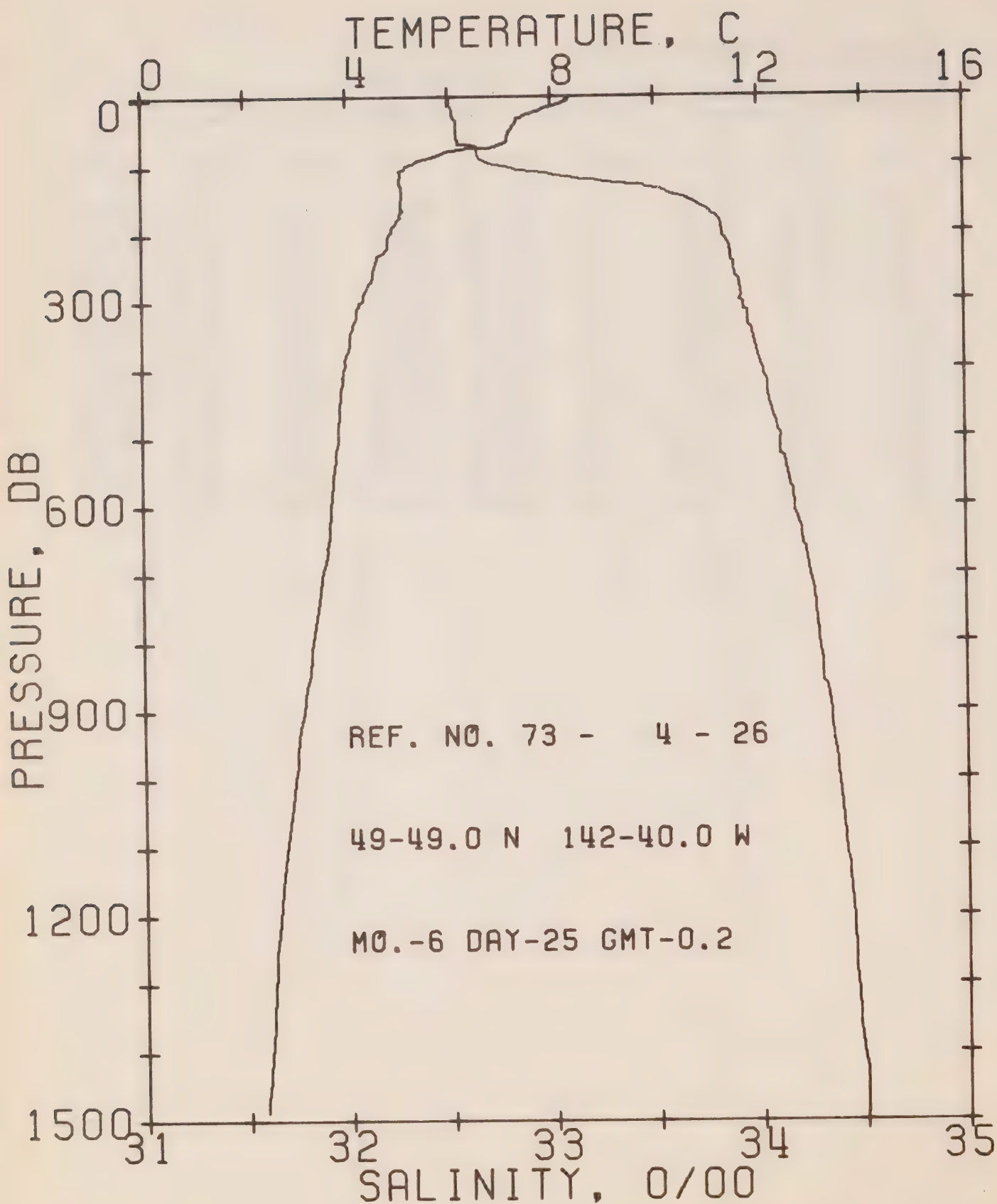
REFERENCE NO. 73- 4- 25

DATE 23/ 6/73

POSITION 50- 0.0N, 145- 0.0W GMT 19.3

RESULTS OF STP CAST 135 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.99	32.56	0	25.39	260.0	0.0	0.0	1480.
10	8.00	32.57	10	25.39	259.8	0.26	0.01	1480.
20	7.94	32.57	20	25.40	259.1	0.52	0.05	1480.
30	7.73	32.57	30	25.43	256.4	0.78	0.12	1479.
50	7.16	32.58	50	25.52	248.3	1.28	0.32	1477.
75	5.71	32.68	75	25.78	223.4	1.87	0.70	1472.
100	5.37	33.25	99	26.27	177.1	2.37	1.14	1472.
125	4.54	33.58	124	26.63	143.6	2.76	1.59	1469.
150	4.24	33.73	149	26.78	129.2	3.10	2.07	1469.
175	4.32	33.91	174	26.84	124.2	3.42	2.59	1469.
200	4.22	33.83	199	26.86	121.8	3.73	3.18	1469.
225	4.10	33.96	223	26.89	118.8	4.03	3.83	1469.
250	4.04	33.88	248	26.92	117.0	4.32	4.55	1470.
300	3.96	33.92	298	26.96	113.5	4.90	6.15	1470.



OFFSHORE OCEANOGRAPHY GROUP

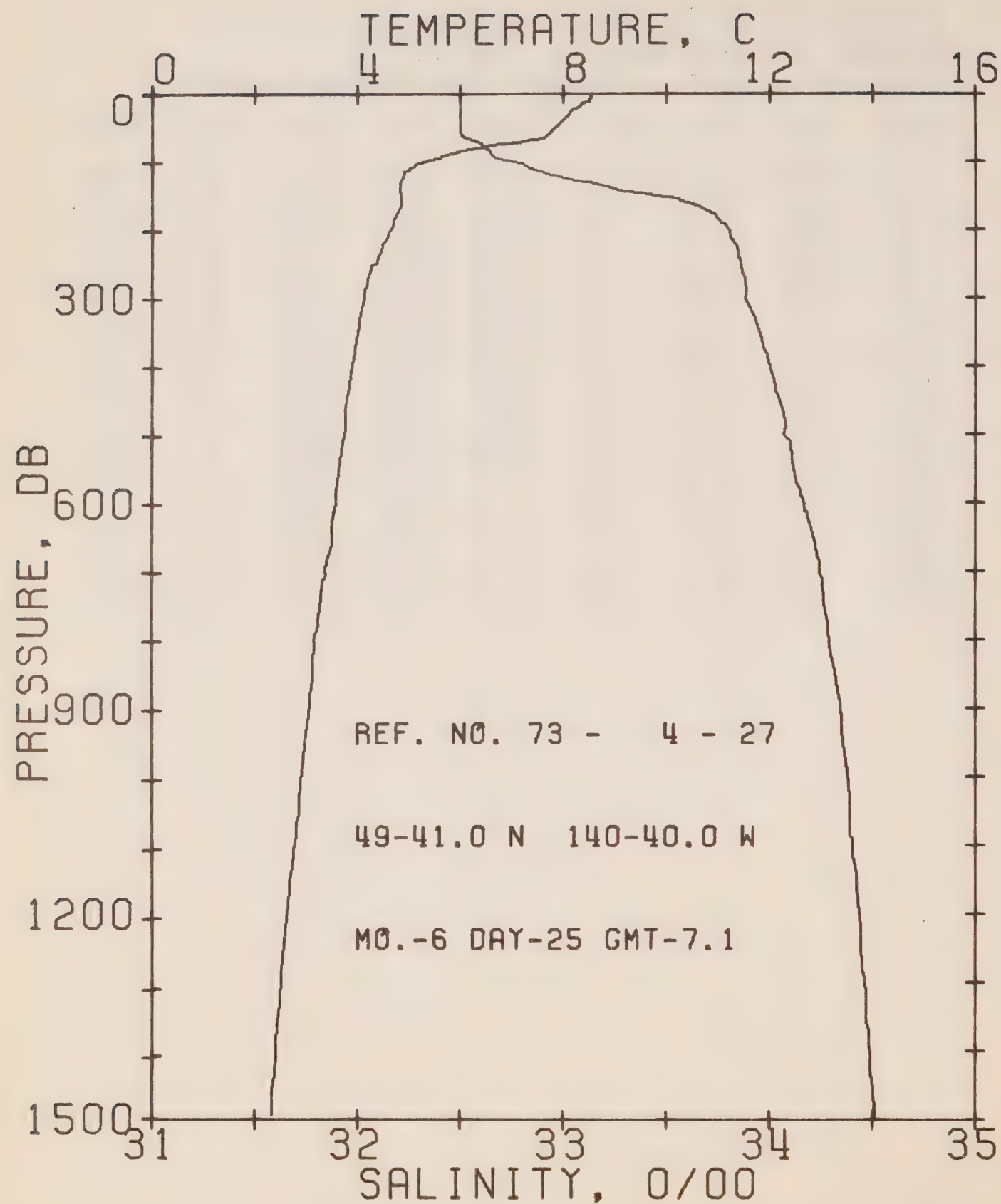
REFERENCE NO. 73- 4- 26

DATE 25/ 6/73

POSITION 49-49.0N, 142-40.0W GMT 0.2

RESULTS OF STP CAST 209 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.40	32.51	0	25.29	269.5	0.0	0.0	1481.
10	8.21	32.51	10	25.31	267.1	0.27	0.01	1481.
20	7.83	32.52	20	25.38	261.3	0.53	0.05	1479.
30	7.46	32.53	30	25.43	256.0	0.79	0.12	1478.
50	7.20	32.54	50	25.48	251.9	1.30	0.33	1477.
75	6.74	32.64	75	25.62	238.8	1.92	0.72	1476.
100	5.31	32.72	99	25.86	216.1	2.49	1.23	1471.
125	5.04	33.26	124	26.32	173.0	2.98	1.79	1471.
150	5.09	33.66	149	26.63	143.8	3.37	2.33	1472.
175	5.03	33.80	174	26.75	132.9	3.72	2.91	1472.
200	4.88	33.83	199	26.79	129.3	4.04	3.53	1472.
225	4.76	33.96	223	26.82	125.9	4.36	4.22	1472.
250	4.54	33.88	248	26.86	122.2	4.67	4.97	1472.
300	4.32	33.91	298	26.91	118.1	5.27	6.65	1472.
400	3.93	34.02	397	27.04	106.6	6.38	10.62	1472.
500	3.81	34.11	496	27.12	99.6	7.42	15.36	1473.
600	3.57	34.17	595	27.18	94.3	8.39	20.80	1474.
800	3.28	34.29	793	27.31	82.8	10.15	33.33	1476.
1000	2.91	34.37	990	27.42	73.6	11.71	47.61	1478.
1200	2.60	34.44	1183	27.50	66.5	13.11	63.24	1480.



OFFSHORE OCEANOGRAPHY GROUP

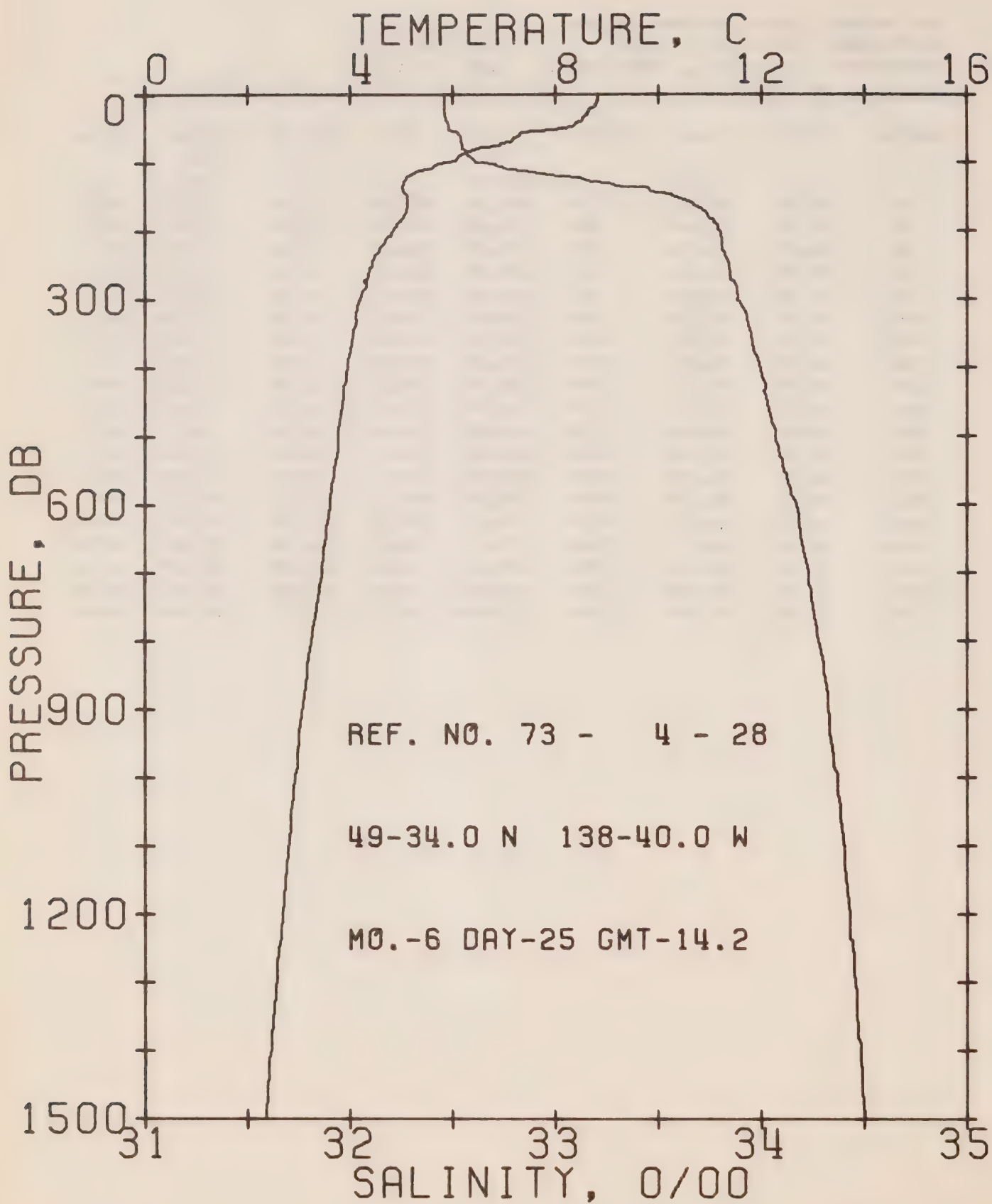
REFERENCE NO. 73- 4- 27

DATE 25/ 6/73

POSITION 49-41.0N, 140-40.0W GMT 7.1

RESULTS OF STP CAST 183 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.56	32.50	0	25.25	272.5	0.0	0.0	1482.
10	8.51	32.50	10	25.26	272.1	0.27	0.01	1482.
20	8.31	32.50	20	25.29	269.5	0.54	0.06	1481.
30	8.10	32.50	30	25.32	266.7	0.81	0.12	1481.
50	7.85	32.50	50	25.36	263.6	1.34	0.34	1480.
75	6.71	32.61	75	25.60	240.7	1.98	0.75	1476.
100	5.36	32.76	99	25.89	213.7	2.56	1.26	1471.
125	4.87	33.01	124	26.14	190.0	3.06	1.83	1470.
150	4.86	33.44	149	26.48	157.7	3.49	2.44	1471.
175	4.77	33.71	174	26.70	136.7	3.86	3.04	1471.
200	4.63	33.80	199	26.79	128.7	4.19	3.67	1471.
225	4.47	33.84	223	26.84	124.2	4.50	4.36	1471.
250	4.35	33.86	248	26.87	121.7	4.81	5.10	1471.
300	4.12	33.88	298	26.91	118.2	5.41	6.77	1471.
400	3.89	34.00	397	27.03	107.5	6.53	10.77	1472.
500	3.73	34.07	496	27.10	101.5	7.57	15.52	1473.
600	3.56	34.17	595	27.19	93.3	8.54	20.95	1474.
800	3.16	34.29	793	27.33	81.2	10.27	33.29	1475.
1000	2.89	34.38	990	27.42	73.2	11.81	47.41	1478.
1200	2.62	34.43	1188	27.49	67.2	13.22	63.18	1480.



OFFSHORE OCEANOGRAPHY GROUP

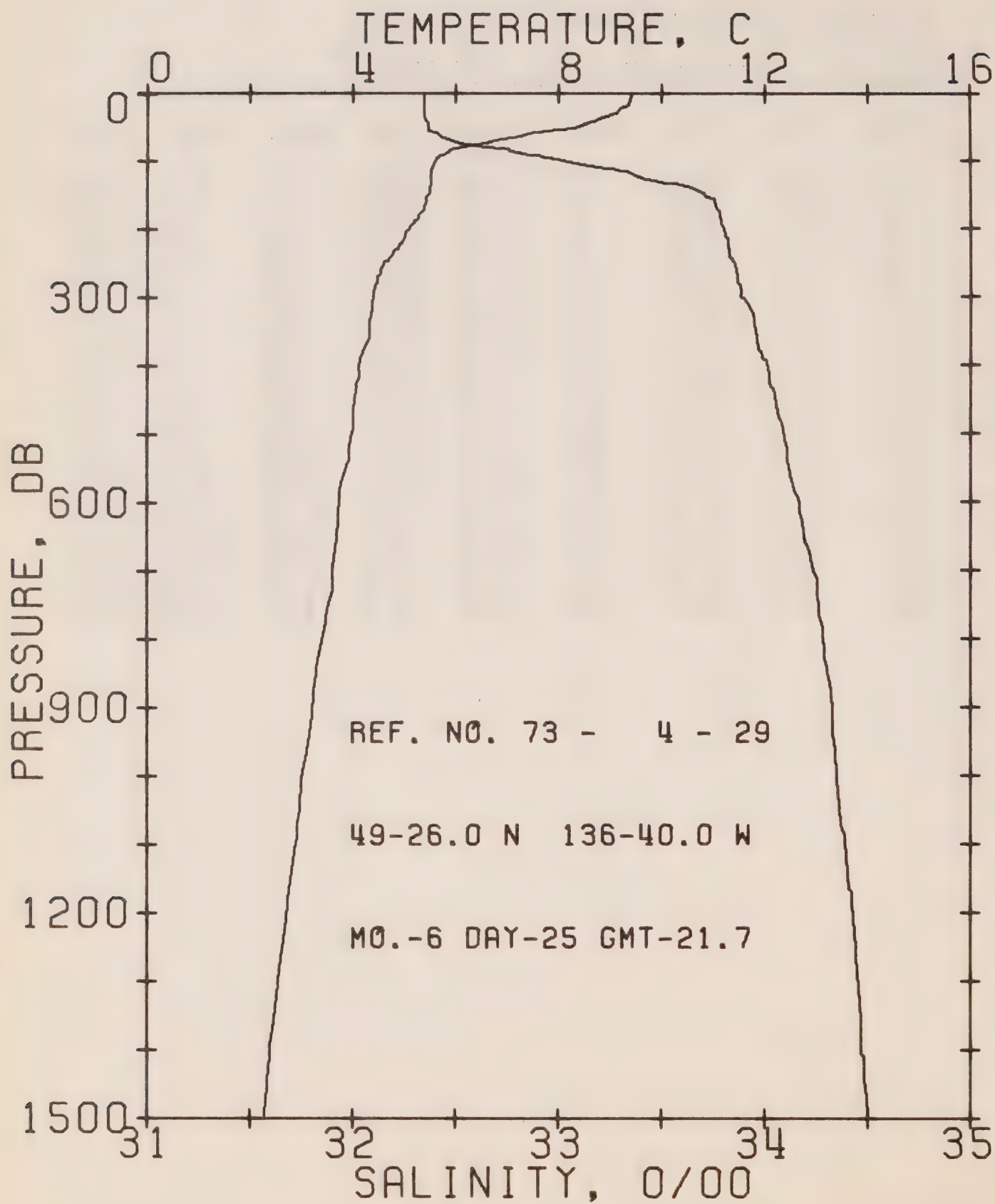
REFERENCE NO. 73- 4- 28

DATE 25/ 6/73

POSITION 49-34.0N, 138-40.0W GMT 14.2

RESULTS OF STP CAST 193 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.82	32.46	0	25.18	279.3	0.0	0.0	1493.
10	8.82	32.46	10	25.18	279.7	0.28	0.01	1483.
20	8.71	32.46	20	25.20	278.2	0.56	0.06	1483.
30	8.60	32.46	30	25.22	276.7	0.84	0.13	1482.
50	8.17	32.48	50	25.30	269.5	1.38	0.35	1481.
75	6.91	32.55	75	25.53	247.7	2.02	0.76	1477.
100	5.95	32.61	99	25.70	231.7	2.62	1.29	1473.
125	5.08	33.14	124	26.22	182.3	3.13	1.88	1471.
150	5.11	33.59	149	26.57	149.2	3.55	2.45	1472.
175	5.08	33.73	174	26.69	138.4	3.90	3.04	1472.
200	4.83	33.79	199	26.76	131.6	4.24	3.69	1472.
225	4.59	33.81	223	26.80	127.8	4.56	4.39	1471.
250	4.42	33.84	248	26.84	124.0	4.88	5.15	1471.
300	4.20	33.88	298	26.90	119.1	5.48	6.84	1471.
400	3.94	33.99	397	27.02	108.8	6.61	10.87	1472.
500	3.77	34.07	496	27.09	101.9	7.67	15.70	1473.
600	3.59	34.16	595	27.19	93.7	8.65	21.21	1474.
800	3.22	34.28	793	27.31	83.0	10.42	33.78	1476.
1000	2.91	34.37	990	27.41	74.0	11.99	48.14	1478.
1200	2.67	34.43	1188	27.48	68.1	13.41	64.09	1480.



OFFSHORE OCEANOGRAPHY GROUP

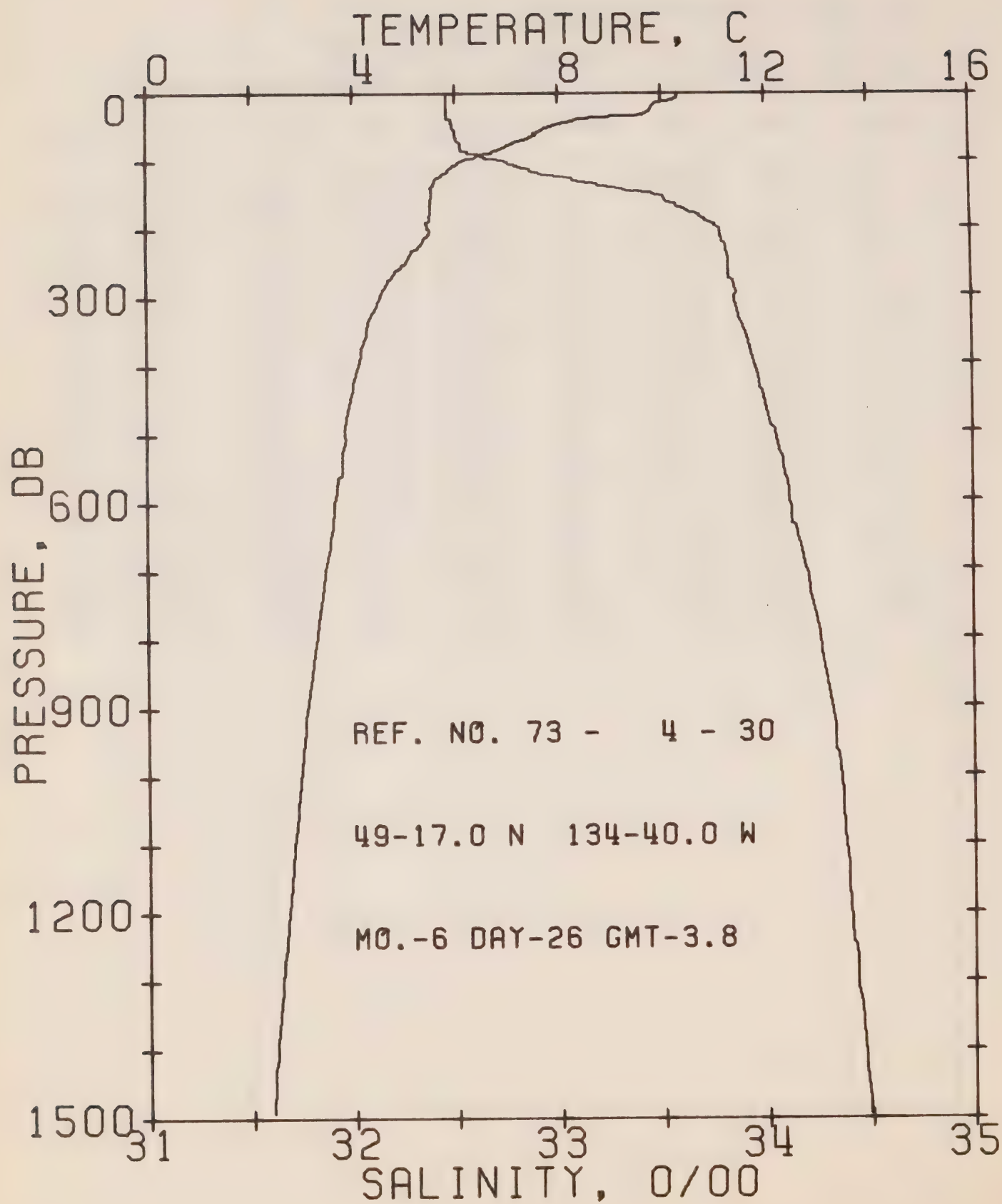
REFERENCE NO. 73- 4- 29

DATE 25/ 6/73

POSITION 49-26.0N, 136-40.0W GMT 21.7

RESULTS OF STD CAST 188 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	9.40	32.35	0	25.01	296.1	0.0	0.0	1485.
10	9.39	32.35	10	25.01	296.3	0.30	0.02	1485.
20	9.29	32.35	20	25.03	294.9	0.59	0.06	1485.
30	9.12	32.35	30	25.05	292.5	0.89	0.14	1484.
50	8.39	32.37	50	25.18	280.7	1.46	0.37	1482.
75	6.49	32.54	75	25.57	243.4	2.12	0.78	1475.
100	5.51	33.00	99	26.05	198.2	2.66	1.27	1472.
125	5.52	33.41	124	26.38	167.1	3.11	1.79	1473.
150	5.48	33.70	149	26.62	144.8	3.50	2.33	1474.
175	5.33	33.78	174	26.70	137.8	3.85	2.91	1474.
200	5.11	33.80	199	26.74	134.1	4.19	3.56	1473.
225	4.89	33.82	223	26.78	130.3	4.52	4.23	1473.
250	4.50	33.85	248	26.83	125.1	4.84	5.05	1472.
300	4.39	33.88	298	26.88	121.1	5.45	6.77	1472.
400	4.11	34.01	397	27.01	109.2	6.60	10.86	1473.
500	3.97	34.09	496	27.09	102.5	7.66	15.71	1474.
600	3.73	34.16	595	27.17	95.3	8.66	21.28	1474.
800	3.40	34.28	793	27.30	84.4	10.46	34.07	1476.
1000	3.00	34.35	990	27.39	76.5	12.06	48.76	1479.
1200	2.71	34.43	1188	27.48	68.6	13.52	65.06	1480.
1500	2.27	34.50	1484	27.57	59.9	15.44	91.41	1483.



OFFSHORE OCEANOGRAPHY GROUP

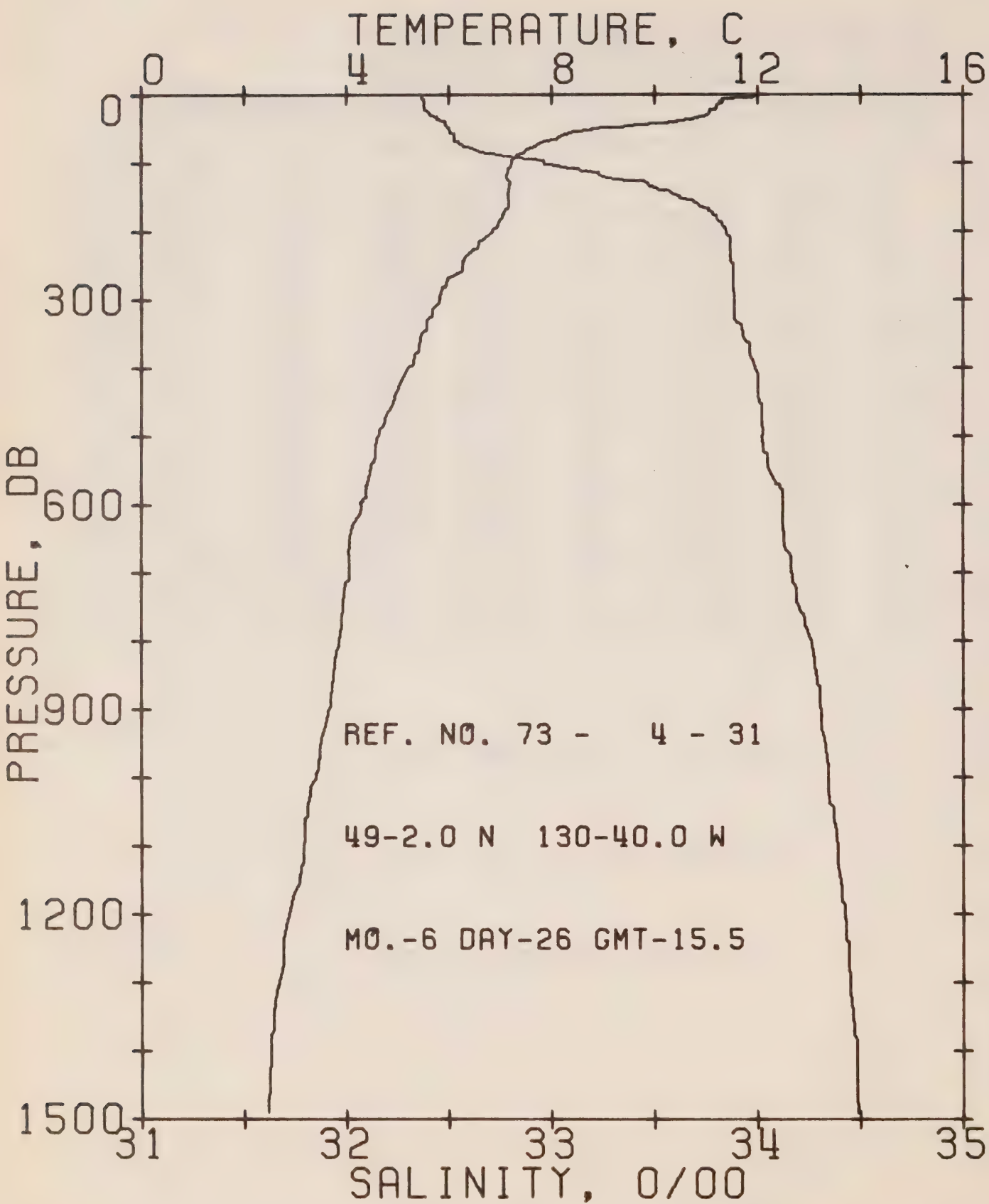
REFERENCE NO. 73- 4- 30

DATE 26/ 6/73

POSITION 49-17.0N, 134-40.0W GMT 3.8

RESULTS OF STP CAST 219 PCINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.31	32.46	0	24.94	302.1	0.0	0.0	1488.
10	10.26	32.46	10	24.95	301.8	0.30	0.02	1488.
20	9.83	32.46	20	25.02	295.1	0.60	0.06	1487.
30	9.72	32.46	30	25.04	293.5	0.89	0.14	1487.
50	7.86	32.49	50	25.35	264.4	1.45	0.36	1480.
75	7.11	32.53	75	25.49	251.7	2.09	0.77	1477.
100	6.21	32.71	99	25.74	227.3	2.70	1.31	1475.
125	5.69	33.03	124	26.06	197.6	3.24	1.93	1473.
150	5.55	33.46	149	26.41	164.2	3.70	2.57	1474.
175	5.52	33.62	174	26.55	152.0	4.09	3.22	1474.
200	5.46	33.77	199	26.67	140.4	4.46	3.92	1475.
225	5.33	33.81	223	26.72	136.2	4.80	4.67	1474.
250	5.05	33.82	243	26.76	132.4	5.14	5.48	1474.
300	4.54	33.85	298	26.84	125.0	5.73	7.28	1472.
400	4.10	33.94	397	26.96	114.1	6.97	11.53	1472.
500	3.85	34.04	496	27.07	104.8	8.07	16.55	1473.
600	3.63	34.11	595	27.14	98.3	9.09	22.23	1474.
800	3.26	34.25	793	27.29	85.1	10.92	35.25	1476.
1000	2.94	34.35	990	27.40	75.7	12.52	49.89	1478.
1200	2.59	34.40	1183	27.46	70.6	13.98	66.26	1480.



OFFSHORE OCEANOGRAPHY GROUP

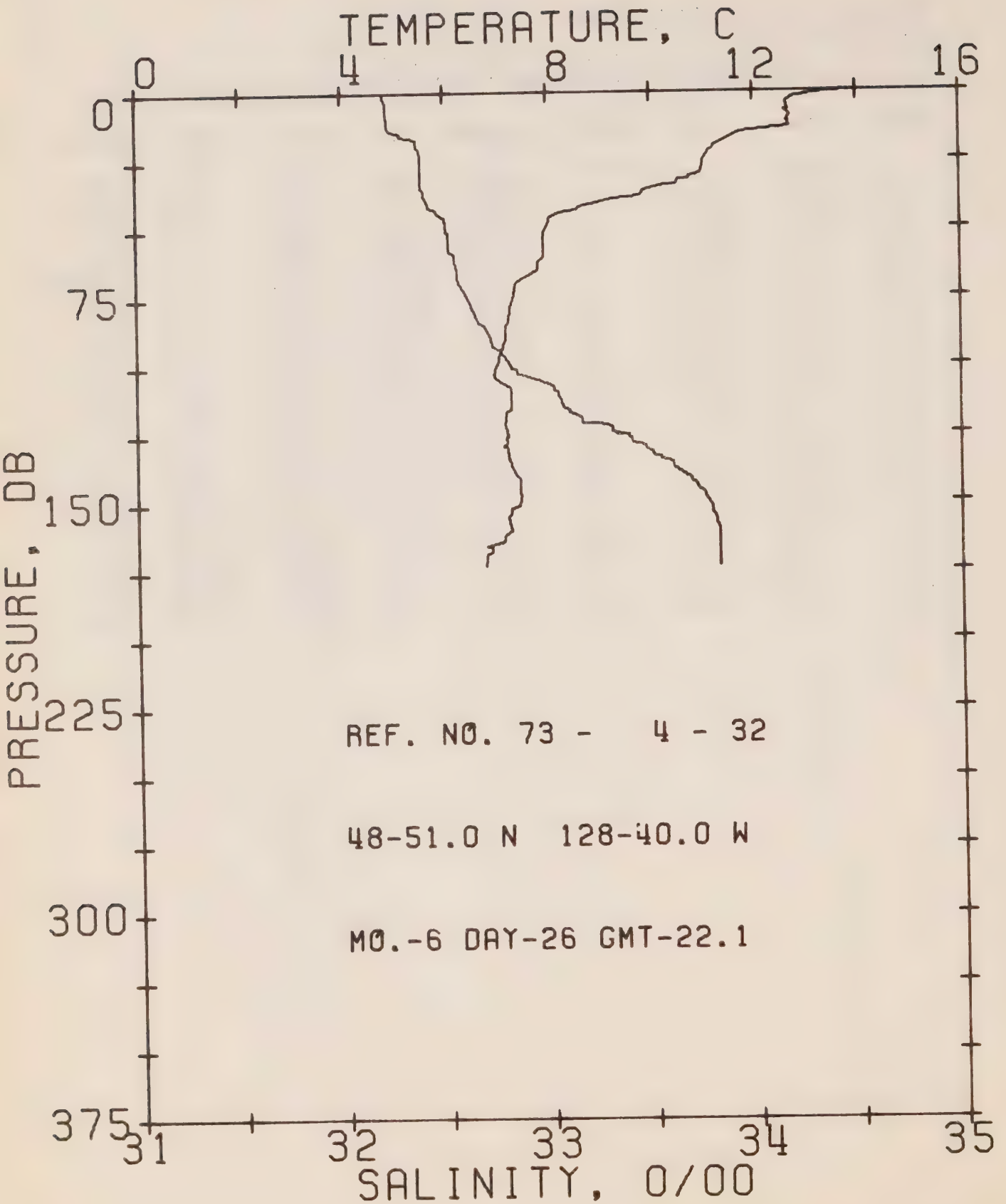
REFERENCE NO. 73- 4- 31

DATE 26/ 6/73

POSITION 49- 2.0N, 130-40.0W GMT 15.5

RESULTS OF STP CAST 282 PCINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.75	32.37	0	24.62	333.0	0.0	0.0	1493.
10	11.31	32.38	10	24.71	325.1	0.33	0.02	1492.
20	11.19	32.38	20	24.73	323.2	0.65	0.07	1492.
30	11.03	32.41	30	24.78	318.6	0.98	0.15	1491.
50	8.92	32.50	50	25.20	278.9	1.58	0.39	1484.
75	7.68	32.57	75	25.44	256.4	2.24	0.82	1480.
100	7.23	32.96	99	25.81	221.6	2.84	1.35	1479.
125	7.17	33.37	124	26.14	190.7	3.36	1.94	1480.
150	7.17	33.62	149	26.33	172.4	3.81	2.57	1480.
175	7.06	33.78	174	26.47	159.4	4.22	3.25	1481.
200	6.86	33.85	199	26.56	151.9	4.61	3.99	1480.
225	6.55	33.87	223	26.61	146.7	4.98	4.80	1479.
250	6.26	33.88	243	26.66	142.6	5.34	5.67	1479.
300	5.82	33.89	293	26.72	136.9	6.04	7.62	1478.
400	5.21	33.99	397	26.87	123.4	7.35	12.28	1477.
500	4.62	34.03	496	26.97	114.7	8.53	17.71	1476.
600	4.29	34.12	595	27.08	104.8	9.63	23.87	1477.
800	3.46	34.26	793	27.23	91.4	11.61	37.93	1478.
1000	3.38	34.34	991	27.35	81.3	13.33	53.68	1480.
1200	2.87	34.42	1183	27.45	70.9	14.85	70.72	1481.



OFFSHORE OCEANOGRAPHY GROUP

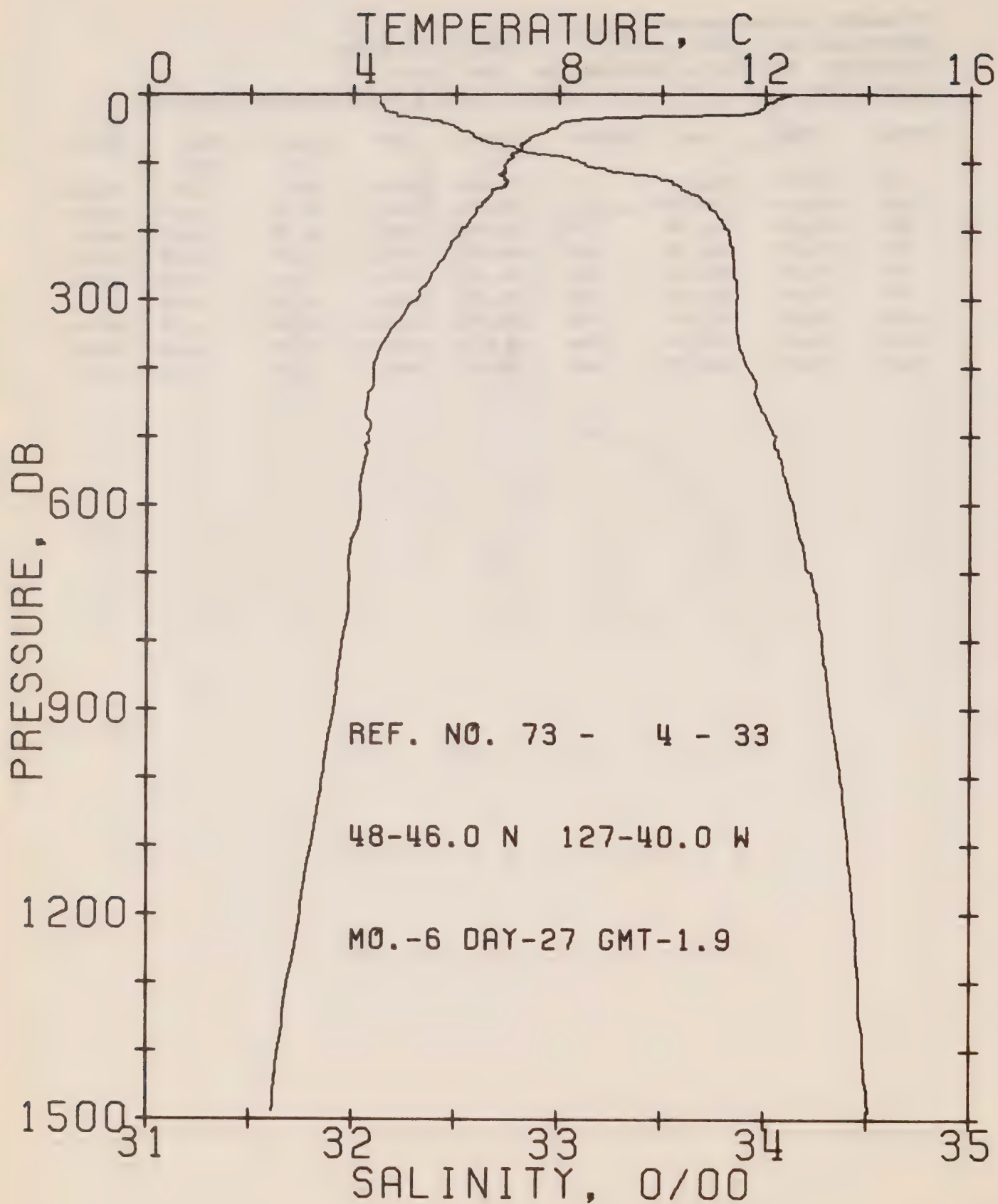
REFERENCE NO. 73- 4- 32

DATE 26/ 6/73

POSITION 48-51.0N, 128-40.0W GMT 22.1

RESULTS OF STP CAST 143 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.85	32.21	0	24.09	383.6	0.0	0.0	1500.
10	12.66	32.23	10	24.34	360.1	0.36	0.02	1496.
20	11.23	32.37	20	24.71	324.7	0.71	0.07	1492.
30	10.97	32.39	30	24.77	319.0	1.03	0.15	1491.
50	7.95	32.51	50	25.35	264.2	1.60	0.39	1480.
75	7.30	32.61	75	25.52	248.4	2.25	0.80	1478.
100	6.99	32.81	99	25.73	229.3	2.85	1.33	1478.
125	7.20	33.36	124	26.12	191.8	3.38	1.94	1480.
150	7.43	33.77	149	26.42	164.7	3.82	2.55	1482.



OFFSHORE OCEANOGRAPHY GROUP

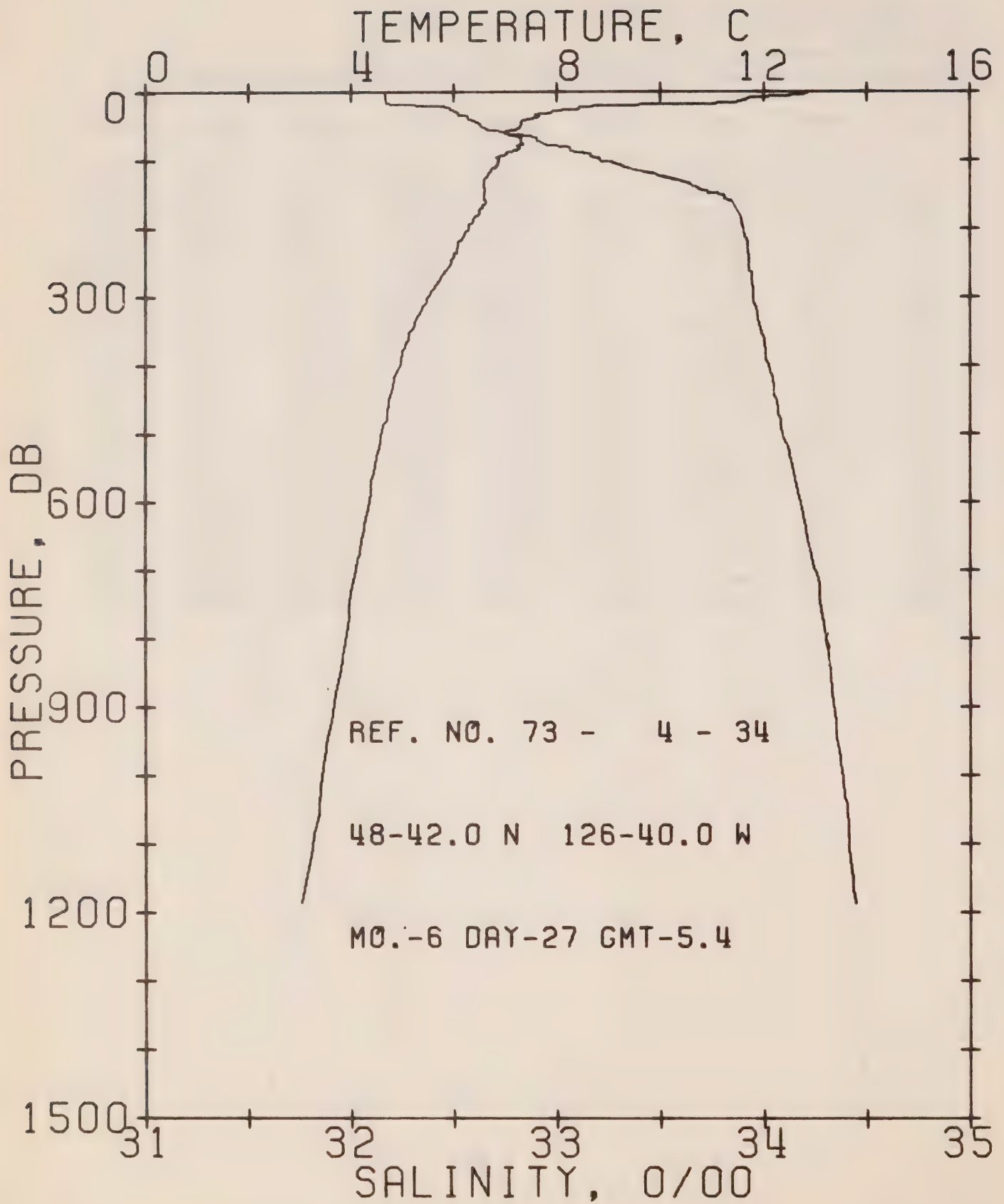
REFERENCE NO. 73- 4- 33

DATE 27/ 6/73

POSITION 48-46.0N, 127-40.0W GMT 1.9

RESULTS OF STP CAST 289 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.35	32.12	0	24.31	362.1	0.0	0.0	1495.
10	12.18	32.13	10	24.35	358.7	0.36	0.02	1495.
20	11.95	32.15	20	24.41	353.4	0.72	0.07	1494.
30	11.49	32.21	30	24.54	341.1	1.07	0.16	1493.
50	7.94	32.51	50	25.35	264.0	1.63	0.39	1480.
75	7.24	32.73	75	25.62	238.5	2.26	0.79	1478.
100	6.99	33.11	99	25.96	207.3	2.82	1.29	1478.
125	6.94	33.49	124	26.26	178.7	3.31	1.84	1479.
150	6.66	33.68	149	26.45	161.2	3.73	2.44	1478.
175	6.37	33.76	174	26.55	152.0	4.12	3.09	1478.
200	6.09	33.82	199	26.63	144.2	4.49	3.79	1477.
225	5.87	33.84	223	26.68	140.3	4.85	4.56	1477.
250	5.65	33.85	248	26.71	137.2	5.20	5.41	1476.
300	5.24	33.87	298	26.77	131.6	5.87	7.29	1475.
400	4.39	33.91	397	26.91	119.6	7.13	11.77	1474.
500	4.32	34.06	496	27.03	108.7	8.27	17.01	1475.
600	4.16	34.14	595	27.11	101.9	9.33	22.93	1476.
800	3.79	34.28	793	27.26	89.0	11.23	36.42	1478.
1000	3.41	34.37	991	27.37	79.6	12.92	51.90	1480.
1200	2.97	34.43	1188	27.46	71.1	14.42	68.68	1481.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 4- 34

DATE 27/ 6/73

POSITION 48-42.0N. 126-40.0W GMT 5.4

RESULTS OF STP CAST 245 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.83	32.17	0	24.26	367.2	0.0	0.0	1497.
10	11.69	32.17	10	24.47	347.2	0.36	0.02	1493.
20	9.58	32.31	20	24.95	302.0	0.70	0.07	1486.
30	7.90	32.51	30	25.36	262.9	0.97	0.14	1480.
50	7.29	32.63	50	25.54	246.3	1.48	0.34	1478.
75	7.31	32.94	75	25.78	223.8	2.06	0.71	1479.
100	6.89	33.21	99	26.05	198.5	2.59	1.18	1478.
125	6.64	33.53	124	26.33	171.9	3.05	1.71	1478.
150	6.60	33.78	149	26.54	153.0	3.46	2.28	1478.
175	6.49	33.88	174	26.63	144.4	3.83	2.90	1478.
200	6.30	33.90	199	26.67	140.9	4.18	3.58	1478.
225	6.08	33.92	223	26.71	137.0	4.53	4.33	1478.
250	5.94	33.93	248	26.74	134.8	4.87	5.15	1478.
300	5.49	33.95	298	26.81	128.5	5.53	7.00	1477.
400	4.94	34.02	397	26.93	117.6	6.76	11.36	1476.
500	4.58	34.09	496	27.02	109.6	7.89	16.55	1476.
600	4.34	34.17	595	27.12	101.6	8.94	22.43	1477.
800	3.89	34.30	793	27.26	88.7	10.83	35.86	1479.
1000	3.42	34.38	991	27.37	79.0	12.50	51.19	1480.

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 4- 35

DATE 27/ 6/73

POSITION 48-38.0N, 126- 0.0W GMT 7.8

RESULTS OF STP CAST 83 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.36	32.15	0	24.34	360.0	0.0	0.0	1495.
10	11.80	32.15	10	24.44	350.5	0.36	0.02	1493.
20	11.37	32.15	20	24.52	342.9	0.71	0.07	1492.
30	9.71	32.27	30	24.89	307.5	1.04	0.15	1486.
50	7.45	32.87	50	25.71	230.5	1.56	0.37	1479.
75	6.89	33.48	75	26.26	177.8	2.07	0.68	1478.
100	6.35	33.79	99	26.58	148.5	2.47	1.04	1477.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	12.36	32.15	50.	7.45	32.87
0.	12.37	32.15	51.	7.43	32.94
0.	12.47	32.15	52.	7.26	32.99
4.	12.58	32.15	53.	7.18	33.03
4.	12.64	32.15	54.	7.16	33.05
6.	12.64	32.15	54.	7.12	33.06
6.	12.62	32.15	57.	7.10	33.08
7.	12.62	32.15	59.	7.09	33.09
8.	12.55	32.15	60.	7.03	33.11
9.	12.51	32.15	60.	6.97	33.12
10.	11.80	32.15	61.	6.97	33.12
12.	11.61	32.15	61.	6.97	33.15
14.	11.58	32.15	62.	6.97	33.15
15.	11.50	32.15	63.	6.96	33.19
16.	11.48	32.15	63.	6.95	33.19
18.	11.47	32.15	64.	6.94	33.19
19.	11.41	32.15	66.	6.88	33.24
23.	11.25	32.17	68.	6.91	33.28
23.	11.14	32.17	69.	6.89	33.31
24.	10.99	32.20	69.	6.89	33.33
25.	10.66	32.22	69.	6.92	33.37
25.	10.44	32.23	71.	6.93	33.42
25.	10.22	32.24	74.	6.91	33.45
27.	10.03	32.24	74.	6.90	33.48
28.	9.97	32.24	76.	6.89	33.49
29.	9.85	32.26	77.	6.87	33.50
31.	9.58	32.23	79.	6.85	33.53
32.	9.52	32.30	79.	6.81	33.53
32.	9.49	32.30	80.	6.79	33.56
34.	9.09	32.31	80.	6.79	33.59
35.	8.66	32.44	81.	6.78	33.60
37.	8.17	32.47	82.	6.72	33.61
39.	8.13	32.48	85.	6.64	33.65
40.	7.96	32.54	86.	6.62	33.67
41.	7.92	32.58	87.	6.53	33.70
42.	7.91	32.61	88.	6.53	33.70
42.	7.87	32.64	89.	6.52	33.74
44.	7.76	32.74	90.	6.41	33.76
46.	7.59	32.82	96.	6.36	33.78
47.	7.51	32.83	100.	6.35	33.79
48.	7.49	32.84	101.	6.34	33.79
49.	7.46	32.87			

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 4- 36

DATE 27/ 6/73

POSITION 48-33.0N, 125-33.0W GMT 9.6

RESULTS OF STP CAST 74 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.44	31.62	0	24.09	383.0	0.0	0.0	1491.
10	11.44	31.62	10	24.09	383.4	0.38	0.02	1491.
20	9.56	31.73	20	24.50	345.0	0.75	0.07	1485.
30	8.57	32.05	30	24.90	306.8	1.07	0.16	1482.
50	8.06	32.43	50	25.27	271.9	1.65	0.39	1481.
75	7.35	33.29	75	26.05	198.3	2.22	0.75	1479.
100	6.65	33.64	99	26.42	163.4	2.68	1.16	1478.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	11.44	31.62	53.	8.04	32.58
10.	11.44	31.62	55.	7.90	32.67
12.	11.12	31.62	56.	7.93	32.74
14.	10.58	31.62	58.	7.98	32.90
14.	10.38	31.62	59.	7.95	32.90
15.	10.20	31.62	60.	7.94	32.91
15.	10.04	31.61	61.	7.94	32.95
16.	10.02	31.66	61.	7.87	33.00
17.	9.65	31.66	62.	7.80	33.00
19.	9.62	31.66	64.	7.80	33.01
19.	9.61	31.69	65.	7.79	33.02
20.	9.56	31.73	66.	7.79	33.07
21.	9.55	31.79	67.	7.73	33.10
23.	9.33	31.80	67.	7.68	33.14
24.	9.22	31.83	69.	7.50	33.21
25.	9.16	31.84	70.	7.47	33.22
27.	8.67	31.92	71.	7.46	33.22
27.	8.64	31.96	73.	7.41	33.24
29.	8.57	32.00	73.	7.41	33.25
30.	8.57	32.05	74.	7.40	33.26
32.	8.62	32.07	74.	7.35	33.27
33.	8.61	32.08	75.	7.35	33.29
33.	8.60	32.08	77.	7.35	33.29
35.	8.57	32.10	78.	7.32	33.31
35.	8.53	32.10	80.	7.29	33.31
36.	8.51	32.11	81.	7.16	33.40
37.	8.49	32.16	83.	7.15	33.40
38.	8.40	32.17	84.	7.15	33.41
39.	8.37	32.18	86.	7.10	33.43
40.	8.28	32.25	89.	7.00	33.47
42.	8.26	32.33	90.	6.99	33.49
43.	8.17	32.40	91.	6.88	33.52
44.	8.10	32.40	94.	6.87	33.52
45.	8.09	32.41	95.	6.84	33.56
46.	8.09	32.42	98.	6.70	33.61
49.	8.07	32.42	100.	6.65	33.64
52.	8.05	32.44	101.	6.62	33.64

SURFACE TEMPERATURE AND SALINITY OBSERVATIONS

(P-73-4)

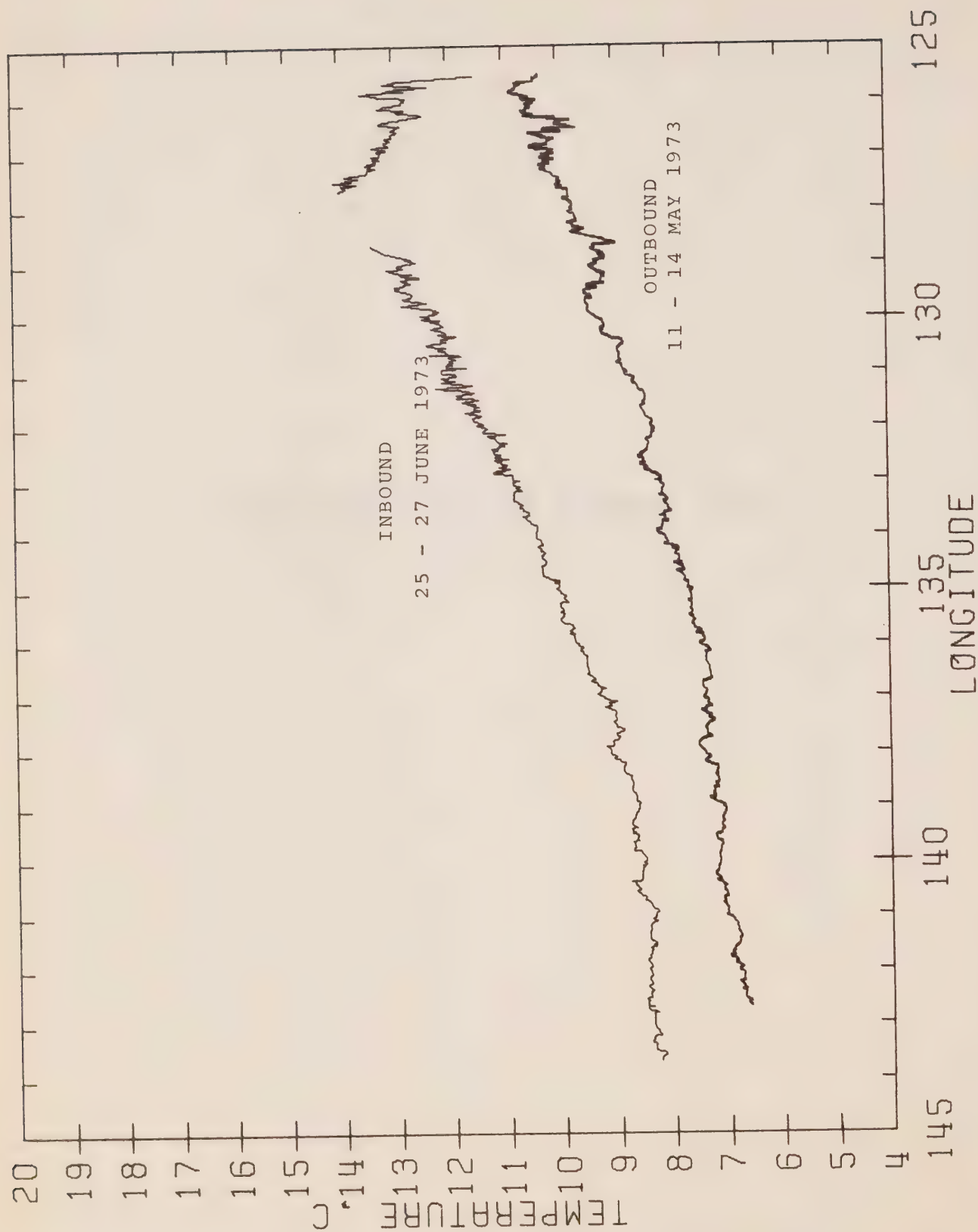


Figure 7 Surface temperature along Line P recorded from engine room intake. P-73-4.

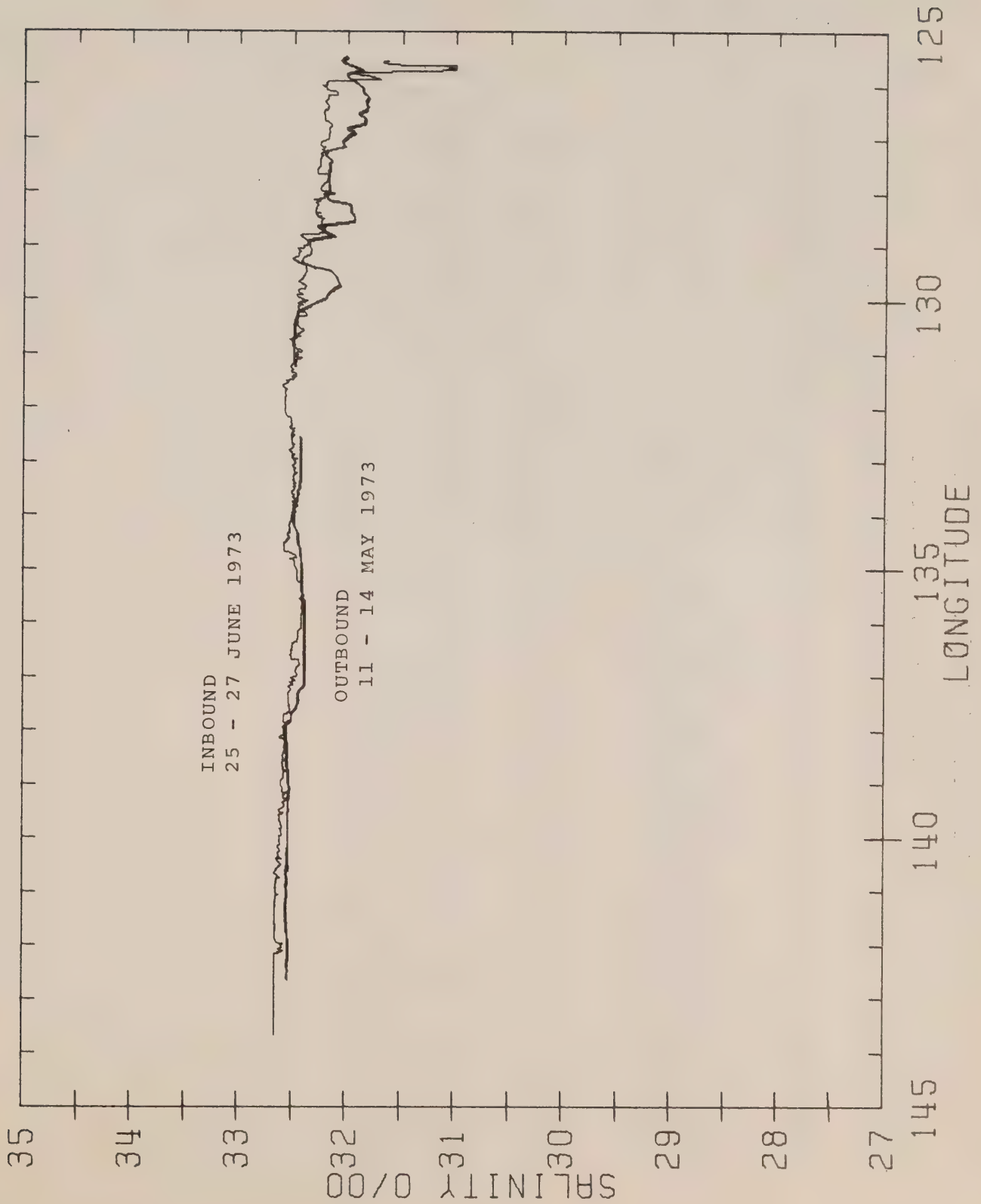


Figure 8 Surface salinity along Line P recorded from thermosalinograph. P-73-4.

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 4

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GMT	0/00	C	WEST
73	5	11	2341	32.033		125-33
73	5	12	126	31.798	10.5	126- 0
73	5	12	352	31.863	9.9	126-40
73	5	12	733	32.220	10.0	127-40
73	5	12	1122	32.191	9.3	128-40
73	5	12	1553	32.072	9.5	129-40
73	5	12	1925	32.520	9.1	130-40
73	5	13	130	32.436	8.5	132-40
73	5	13	800	32.426	8.2	134-40
73	5	13	1347	32.379		136-40
73	5	13	1932	32.544	7.5	138-40
73	5	14	135	32.552	7.2	140-40
73	5	14	805	32.547	6.7	142-40
73	5	15	0	32.602	6.6	145- 0
73	5	16	0	32.557	6.4	ON STATION
73	5	17	0	32.597	6.4	ON STATION
73	5	18	0	32.605	6.2	ON STATION
73	5	19	0	32.581	6.4	ON STATION
73	5	20	0	32.593	6.4	ON STATION
73	5	21	0	32.592	6.4	ON STATION
73	5	22	0	32.574	6.3	ON STATION
73	5	23	0	32.614	6.4	ON STATION
73	5	24	0	32.610	6.6	ON STATION
73	5	25	0	32.605	6.3	ON STATION
73	5	26	0	32.611	6.5	ON STATION
73	5	27	0	32.614	6.7	ON STATION
73	5	28	0	32.615	6.7	ON STATION
73	5	29	0	32.571	6.7	ON STATION
73	5	30	0	32.609	6.9	ON STATION
73	5	31	0	32.601	7.0	ON STATION
73	6	1	0	32.600	7.0	ON STATION
73	6	2	0	32.602	7.2	ON STATION
73	6	3	0	32.581	7.1	ON STATION
73	6	4	0	32.567	7.2	ON STATION
73	6	5	0	32.590	7.2	ON STATION
73	6	6	0	32.577	7.1	ON STATION
73	6	7	0	32.569	7.2	ON STATION
73	6	8	0	32.590	7.3	ON STATION
73	6	12	0	32.573	7.7	ON STATION
73	6	13	0	32.570	7.3	ON STATION
73	6	14	0	32.588	7.4	ON STATION
73	6	15	0	32.590	7.4	ON STATION
73	6	16	0	32.581	7.5	ON STATION
73	6	17	0	32.580	7.5	ON STATION
73	6	18	0	32.577	7.6	ON STATION

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 4

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GMT	0/00	C	WEST
73	6	18	0	32.577	7.6	ON STATION
73	6	19	0	32.572	7.8	ON STATION
73	6	20	0	32.565	8.0	ON STATION
73	6	21	0	32.566	8.2	ON STATION
73	6	22	0	32.571	8.3	ON STATION
73	6	23	0	32.571	8.1	ON STATION
73	6	24	0	32.568	8.2	ON STATION
73	6	25	12	32.497	8.9	142-40
73	6	25	705	32.487	8.7	140-40
73	6	25	1415	32.455	9.0	138-40
73	6	25	2142	32.352	9.7	136-40
73	6	25	350	32.459	11.0	134-40
73	6	26	1531	32.355	12.2	130-40
73	6	26	2208	32.174	14.0	128-40
73	6	27	150	32.201	13.5	127-40
73	6	27	522	32.156	12.6	126-40
73	6	27	750	32.151	12.4	126- 0
73	6	27	934	31.601	11.5	125-33

OCEANOGRAPHIC DATA OBTAINED ON CRUISE P-73-5
(CODC REFERENCE NO. 15-73-005)

SURFACE TEMPERATURE AND SALINITY OBSERVATIONS

(P-73-5)

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 5

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GMT	0/00	C	WEST
73	6	22	2240	31.839	12.7	125-33
73	6	23	0	32.060	12.3	126- 0
73	6	23	230	32.121	11.7	126-40
73	6	23	530	32.215	12.2	127-40
73	6	23	950	32.192	11.9	128-40
73	6	23	1200	32.370	11.5	129-40
73	6	23	1500	32.271	11.4	130-40
73	6	23	2100	32.436	10.5	132-40
73	6	24	0	32.410	10.1	133-40
73	6	24	300	32.397	9.9	134-40
73	6	24	920	32.357	9.3	136-40
73	6	24	1205	32.456	9.2	137-40
73	6	24	1515	32.475	8.9	138-40
73	6	24	2150	32.508	8.8	140-40
73	6	25	30	32.500	8.4	141-40
73	6	25	300	32.502	8.5	142-40
73	6	25	0	32.588	8.4	ON STATION
73	6	26	0	32.566	8.1	ON STATION
73	6	27	0	32.582	8.4	ON STATION
73	6	28	0	32.580	8.7	ON STATION
73	6	29	0	32.584	8.7	ON STATION
73	6	30	0	32.561	8.9	ON STATION
73	7	1	0	32.560	8.8	ON STATION
73	7	2	0	32.560	8.7	ON STATION
73	7	3	0	32.557	8.9	ON STATION
73	7	4	0	32.551	9.1	ON STATION
73	7	5	0	32.558	8.9	ON STATION
73	7	6	0	32.514	9.2	ON STATION
73	7	7	0	32.509	9.5	ON STATION
73	7	8	0	32.524	10.5	ON STATION
73	7	9	0	32.445	9.9	ON STATION
73	7	10	0	32.467	10.5	ON STATION
73	7	11	0	32.462	9.7	ON STATION
73	7	12	0	32.460	9.6	ON STATION
73	7	13	0	32.502	9.6	ON STATION
73	7	14	0	32.461	10.7	ON STATION
73	7	15	0	32.460	10.2	ON STATION
73	7	16	0	32.461	10.4	ON STATION
73	7	17	0	32.459	10.4	ON STATION
73	7	18	0	32.482	10.4	ON STATION
73	7	19	0	32.457	10.4	ON STATION
73	7	20	0	32.468	11.0	ON STATION
73	7	21	0	32.461	10.5	ON STATION
73	7	22	0	32.460	11.0	ON STATION
73	7	23	0	32.459	10.7	ON STATION

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 5

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GMT	0/00	C	WEST
73	7	23	0	32.459	10.7	ON STATION
73	7	24	0	32.458	11.0	ON STATION
73	7	25	0	32.453	11.2	ON STATION
73	7	26	0	32.467	11.2	ON STATION
73	7	27	0	32.467	11.3	ON STATION
73	7	28	0	32.464	11.1	ON STATION
73	7	29	0	32.474	11.3	ON STATION
73	7	30	0		11.5	ON STATION
73	7	31	0	32.495	11.6	ON STATION
73	8	1	0	32.488	11.7	ON STATION
73	8	2	0	32.472	12.4	ON STATION
73	8	3	0	32.485	11.7	ON STATION
73	8	4	0	32.499	11.7	ON STATION
73	8	5	0	32.453	11.7	ON STATION
73	8	6	230	32.467	12.3	142-40
73	8	6	805	32.419	12.2	141-40
73	8	6	1130	32.402	12.4	140-40
73	8	6	1430	32.320	12.7	139-40
73	8	6	1700	32.417	12.9	138-40
73	8	6	2020	32.414	13.3	137-40
73	8	6	2315	32.319	13.3	136-40
73	8	7	200	32.348	13.3	135-40
73	8	7	615	32.373	13.8	134-40
73	8	7	810	32.429	13.8	133-40
73	8	7	1115	32.474	14.1	132-40
73	8	7	1400	32.398	14.6	131-40
73	8	7	1700	32.178	14.8	130-40
73	8	7	2050	32.170	14.5	129-40
73	8	7	2225	32.054	14.5	128-40
73	8	8	100	32.001	13.7	127-40
73	8	8	400	32.141	13.7	126-40
73	8	8	600	31.657	11.1	126- 0
73	8	8	830	32.223	11.4	125-33

OCEANOGRAPHIC DATA OBTAINED ON CRUISE P-73-6
(CODC REFERENCE NO. 15-73-006)

RESULTS OF HYDROGRAPHIC OBSERVATIONS

(P-73-6)

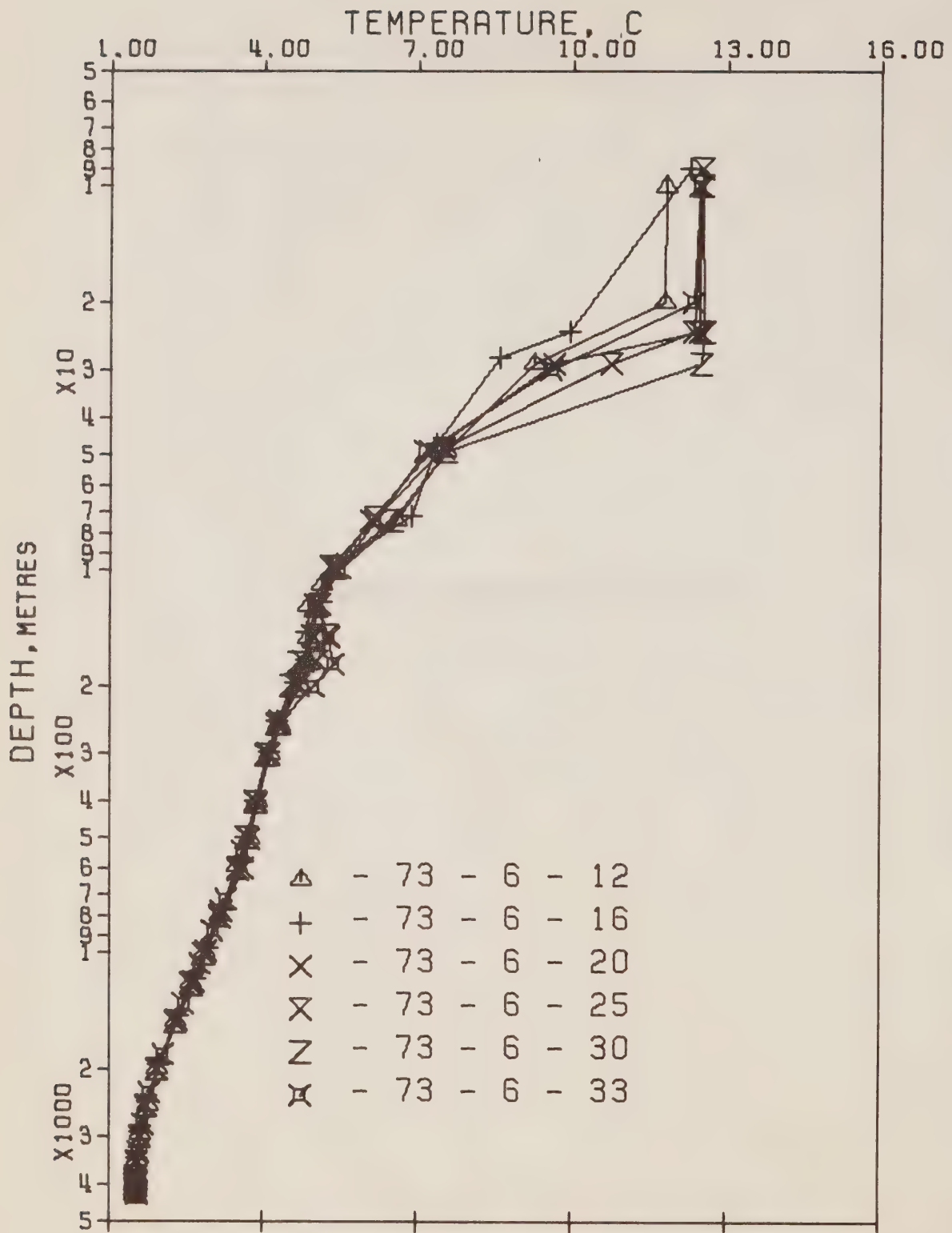


Figure 9 Composite plot of temperature vs \log_{10} depth. P-73-6.

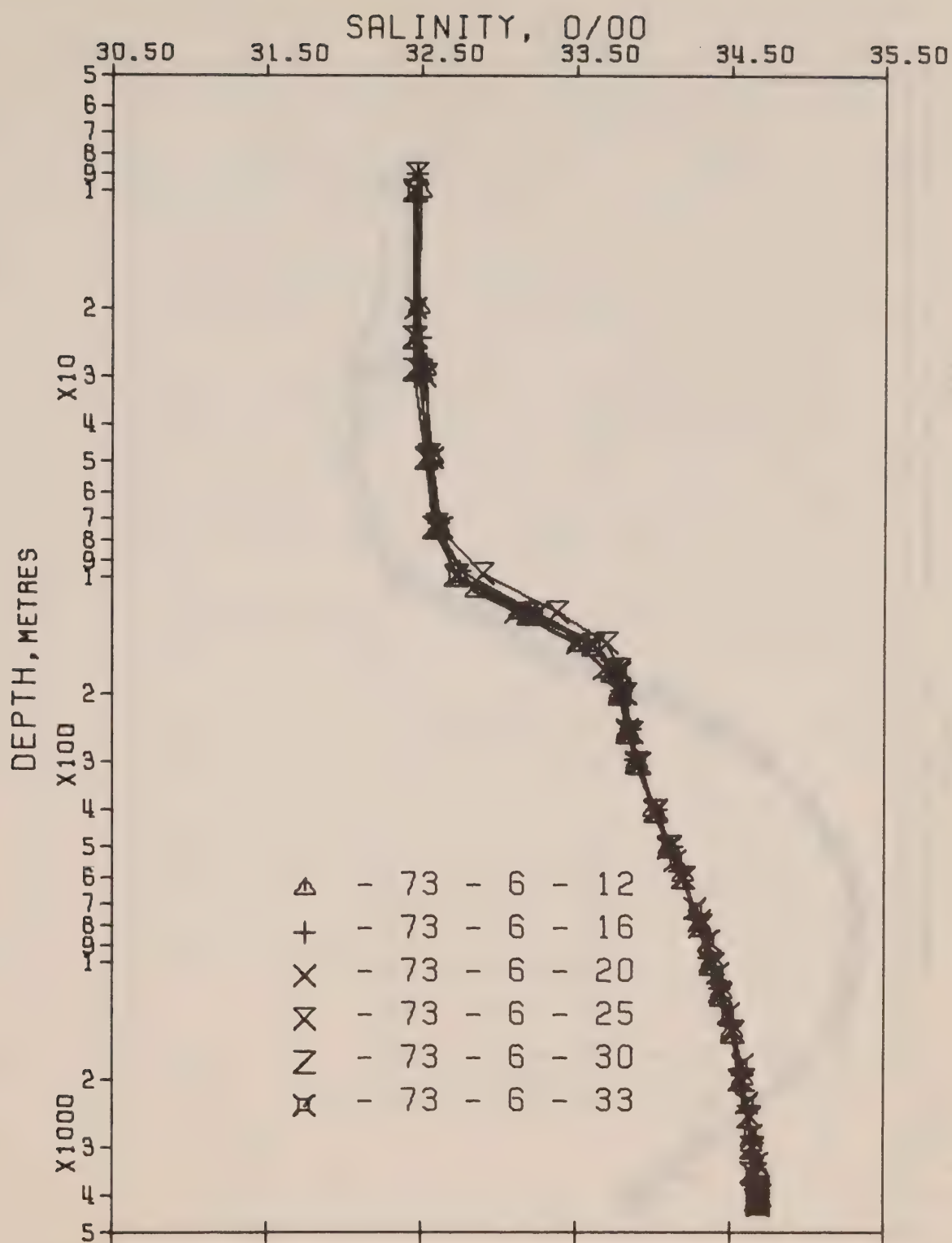


Figure 10 Composite plot of salinity vs \log_{10} depth. P-73-6.

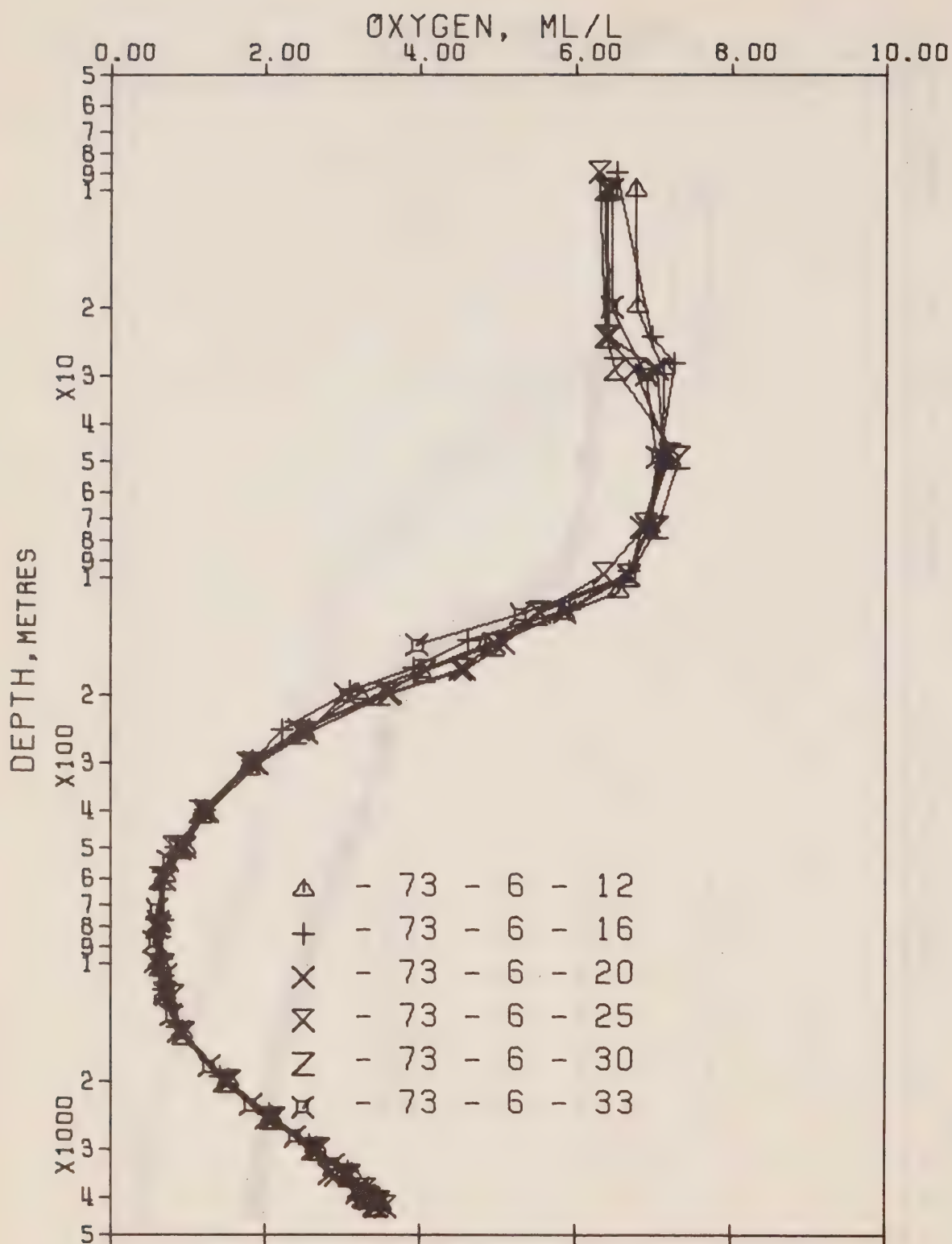
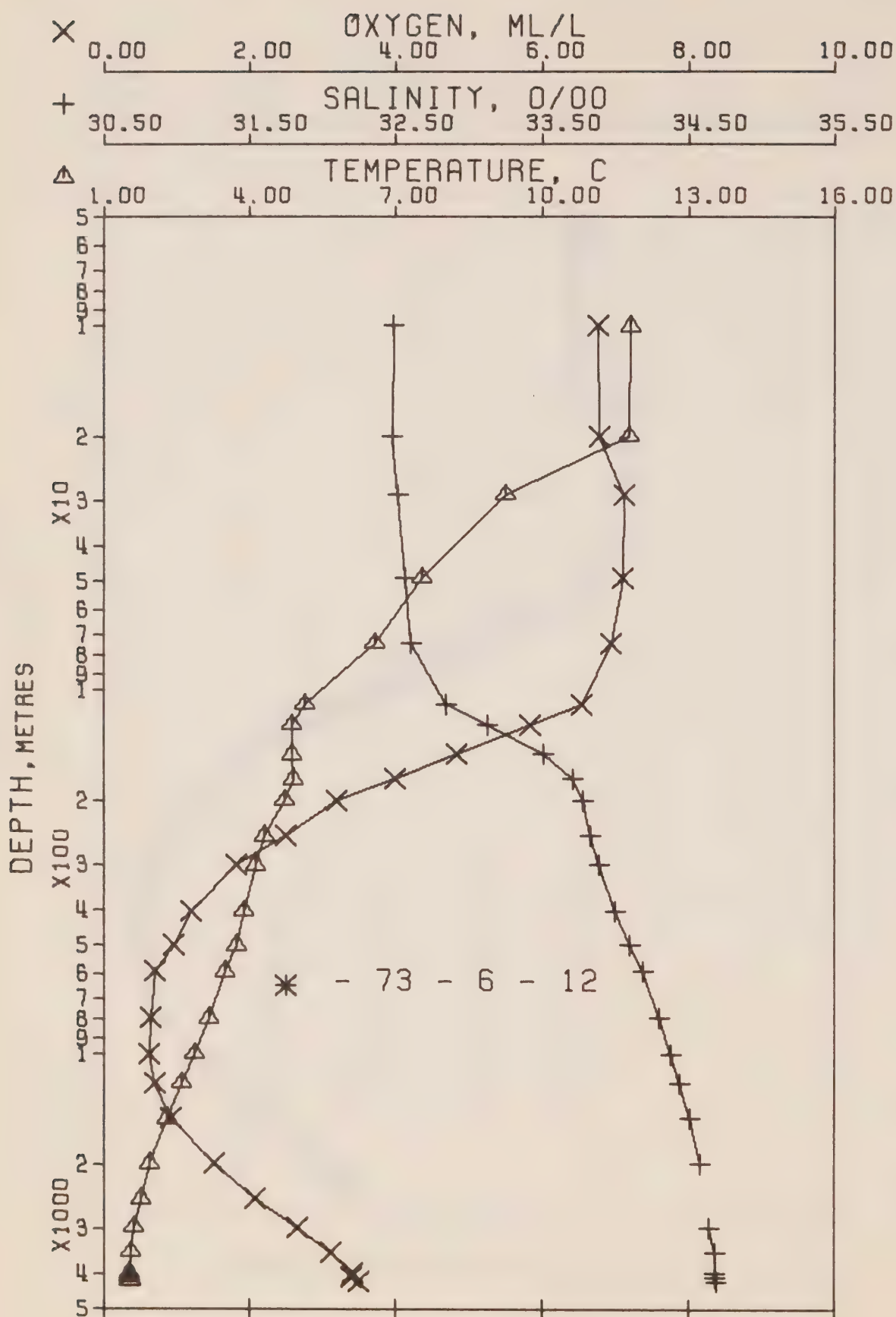
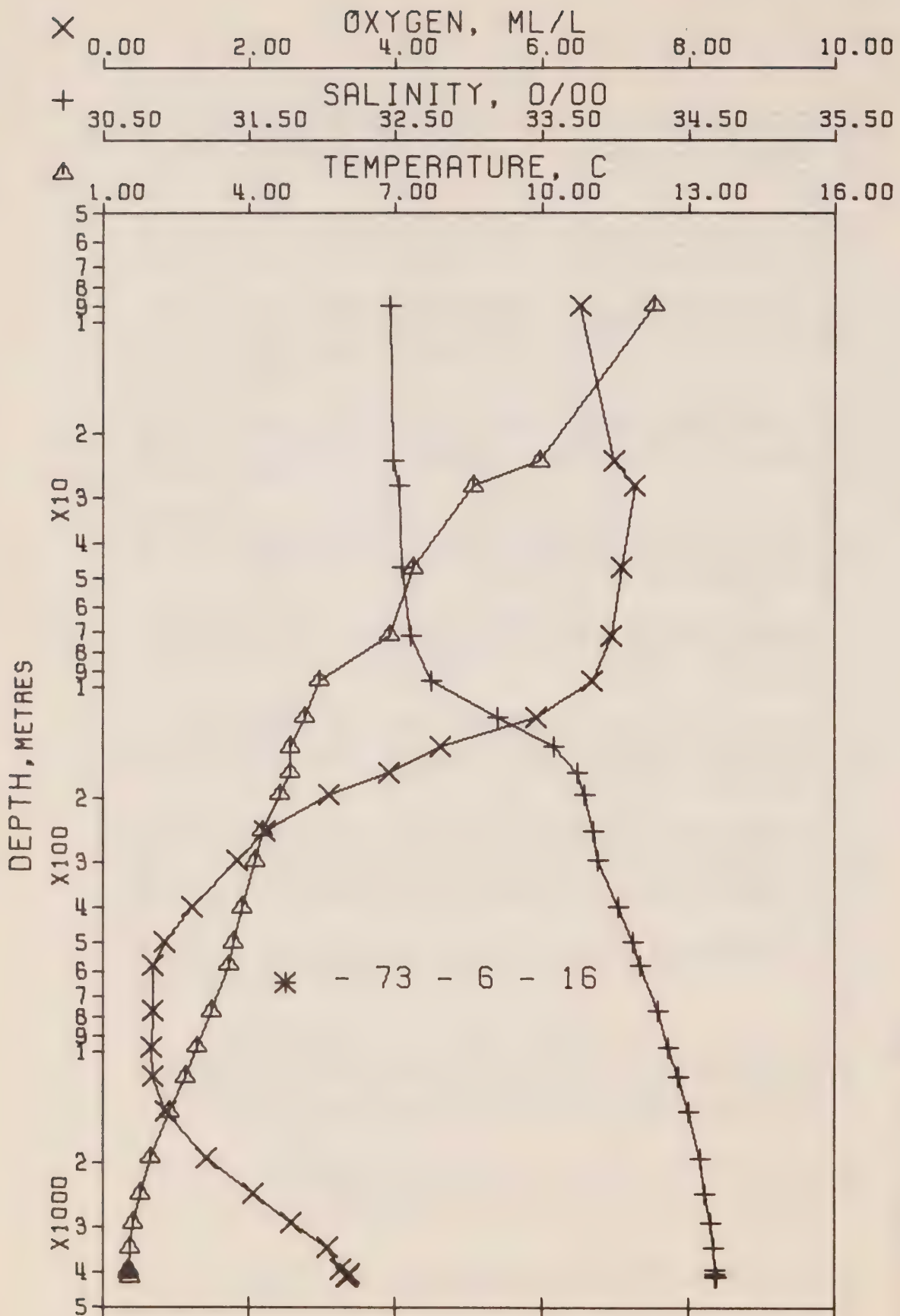


Figure 11 Composite plot of oxygen vs \log_{10} depth. P-73-6.



OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50- 0.0 N, 145- 0.0 W GMT 19.3
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 6- 12										DATE 3/ 3/73	
PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	11.84	32.477	0	24.685	326.9	11.84	326.7	0.0	0.0	6.75	1494.
10	11.80	32.488	10	24.701	325.6	11.80	325.1	0.33	0.02	6.75	1494.
20	11.77	32.479	20	24.700	326.0	11.77	325.2	0.66	0.07	6.78	1494.
29	9.25	32.525	29	25.167	281.5	9.25	280.7	0.93	0.14	7.13	1485.
49	7.55	32.574	49	25.459	253.9	7.55	253.0	1.46	0.35	7.10	1479.
74	6.57	32.606	74	25.616	239.2	6.56	238.0	2.08	0.74	6.94	1475.
110	5.15	32.853	109	25.983	204.5	5.14	203.1	2.87	1.48	6.54	1471.
125	4.88	33.132	124	26.234	180.8	4.87	179.3	3.16	1.83	5.83	1470.
151	4.88	33.515	150	26.537	152.3	4.87	150.5	3.59	2.44	4.83	1471.
176	4.90	33.711	175	26.690	138.1	4.89	135.9	3.95	3.04	3.99	1472.
201	4.72	33.785	200	26.769	130.8	4.70	128.5	4.29	3.69	3.21	1472.
253	4.29	33.831	251	26.852	123.2	4.27	120.5	4.94	5.20	2.50	1471.
304	4.11	33.887	302	26.915	117.6	4.09	114.6	5.56	6.95	1.82	1471.
406	3.88	34.002	403	27.030	107.5	3.85	103.6	6.70	11.10	1.19	1472.
505	3.72	34.097	501	27.121	99.5	3.68	94.9	7.73	15.85	0.96	1473.
596	3.48	34.187	591	27.216	90.9	3.44	85.8	8.59	20.70	0.69	1473.
801	3.16	34.302	794	27.338	80.4	3.10	74.2	10.33	33.10	0.63	1475.
1007	2.87	34.379	997	27.426	72.8	2.80	65.8	11.90	47.55	0.62	1478.
1210	2.60	34.436	1198	27.495	66.9	2.52	59.1	13.32	63.59	0.71	1480.
1515	2.30	34.506	1498	27.576	59.8	2.20	51.3	15.24	90.24	0.92	1484.
2019	1.94	34.580	1994	27.665	52.4	1.80	42.7	18.03	140.59	1.52	1491.
2522	1.75	34.617*	2483	27.708	49.1	1.57	38.3	20.57	199.37	2.09	1498.
3026	1.59	34.641	2982	27.740	46.8	1.37	35.1	22.98	267.62	2.65	1506.
3533	1.54	34.678	3478	27.773	44.9	1.27	31.6	25.30	344.97	3.11	1515.
4047	1.52	34.682	3979	27.778	45.7	1.19	30.8	27.62	434.69	3.41	1524.
4151	1.51	34.684	4080	27.780	45.7	1.17	30.6	28.09	454.45	3.39	1525.
4244	1.54	34.686*	4171	27.779	46.3	1.19	30.6	28.53	472.98	0.0	1527.
4254	1.52	34.686	4181	27.781	45.9	1.17	30.4	28.57	475.04	3.49	1527.

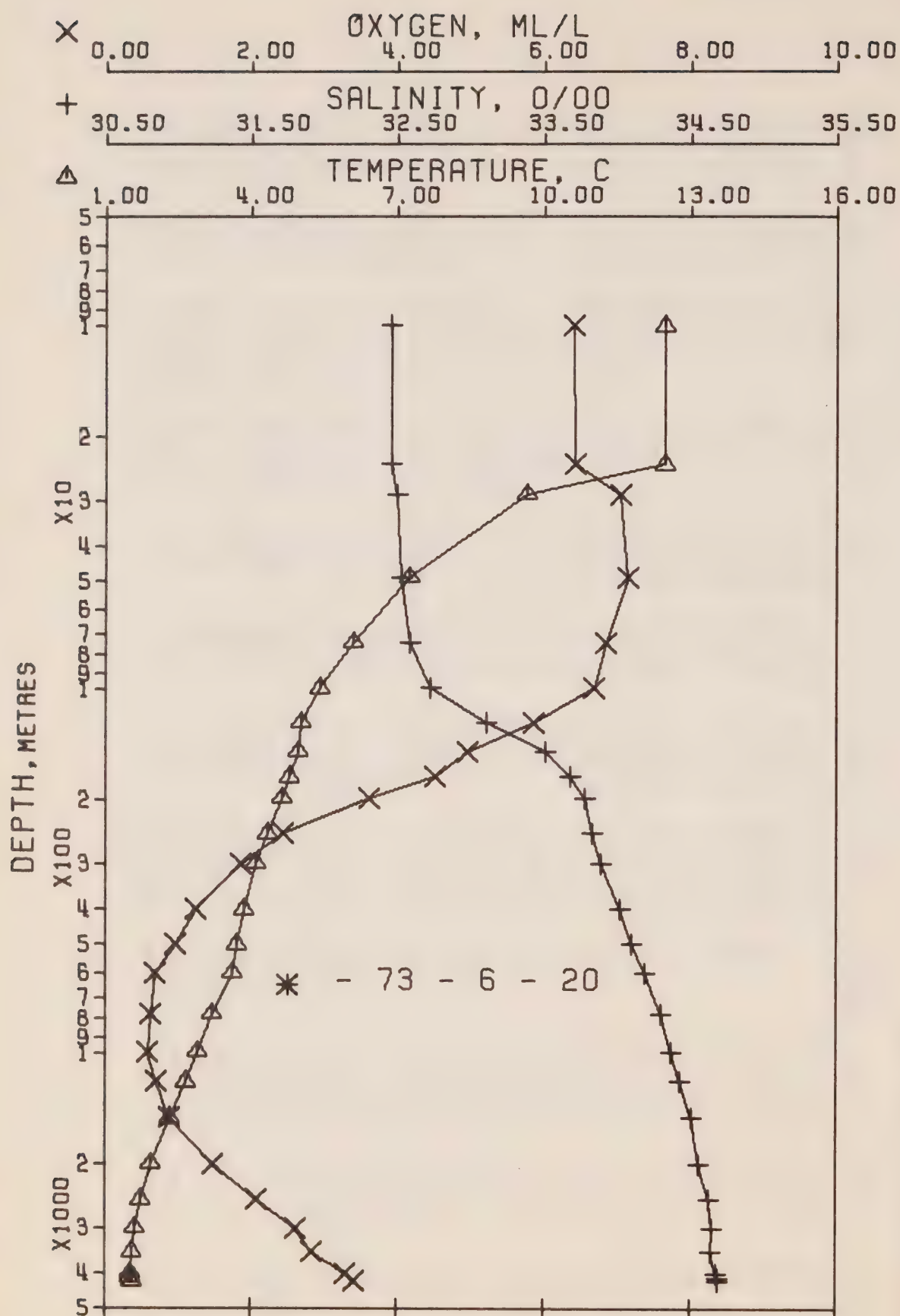


OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50- 0.0 N, 145- 0.0 W GMT 18.7
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 6- 16

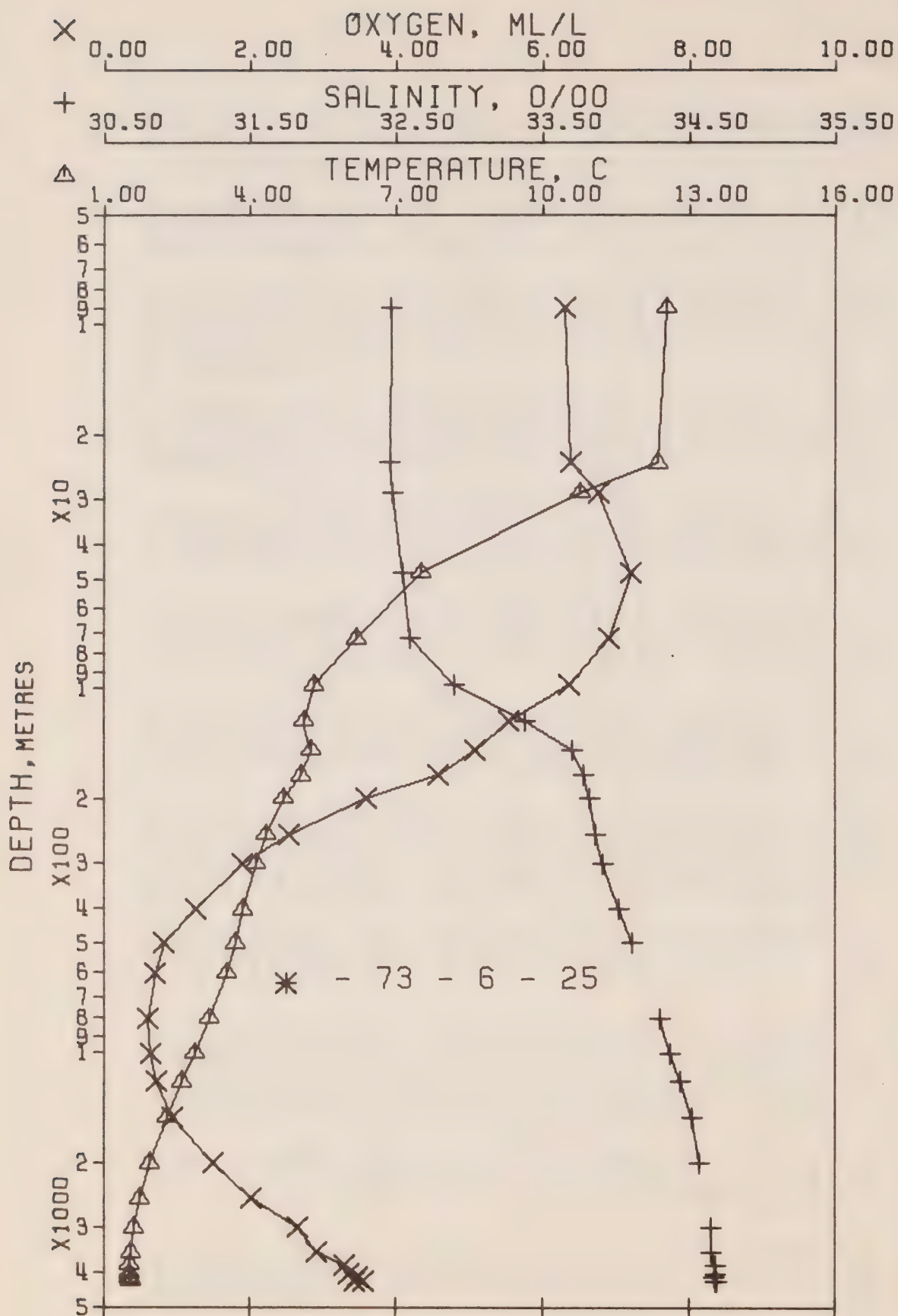
DATE 15/ 8/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.31	32.477	0	24.597	335.2	12.31	335.0	0.0	0.0	6.52	1495.
9	12.28	32.475	9	24.601	335.1	12.28	334.7	0.30	0.01	6.52	1495.
24	9.93	32.488	24	25.028	294.6	9.93	294.0	0.79	0.10	6.97	1487.
28	8.60	32.534	28	25.275	271.2	8.60	270.5	0.90	0.13	7.25	1482.
47	7.35	32.550	47	25.468	253.0	7.35	252.1	1.39	0.31	7.08	1473.
72	6.89	32.613	72	25.580	242.7	6.88	241.5	2.01	0.70	6.94	1477.
97	5.43	32.746	96	25.867	215.4	5.42	214.2	2.57	1.18	6.69	1471.
122	5.14	33.198	121	26.257	178.6	5.13	177.1	3.06	1.73	5.92	1471.
147	4.83	33.585	146	26.598	146.5	4.82	144.7	3.47	2.28	4.63	1471.
172	4.33	33.743	171	26.723	134.9	4.82	132.8	3.82	2.85	3.93	1471.
193	4.02	33.794	197	26.787	129.0	4.61	126.8	4.16	3.50	3.09	1471.
250	4.28	33.846	248	26.865	122.0	4.26	119.4	4.81	4.97	2.21	1471.
301	4.11	33.881	299	26.910	118.0	4.09	115.0	5.42	6.71	1.85	1471.
405	3.85	34.021	402	27.048	105.7	3.82	101.9	6.59	10.89	1.23	1472.
506	3.66	34.119	502	27.145	97.2	3.62	92.6	7.61	15.63	0.83	1473.
533	3.57	34.166	578	27.191	93.3	3.53	88.3	8.34	19.68	0.69	1473.
781	3.23	34.286	774	27.319	82.1	3.18	76.0	10.07	31.74	0.68	1475.
979	2.91	34.363	970	27.410	74.3	2.84	67.3	11.62	45.61	0.66	1477.
1179	2.67	34.430	1167	27.484	67.9	2.59	60.2	13.03	61.17	0.68	1480.
1478	2.34	34.504	1462	27.572	60.3	2.24	51.8	14.94	87.02	0.86	1483.
1978	1.97	34.584	1954	27.665	52.3	1.83	42.7	17.72	135.97	1.43	1490.
2481	1.76	34.615	2448	27.706	49.2	1.58	38.5	20.26	193.75	2.07	1498.
2986	1.60	34.655	2943	27.750	45.8	1.38	34.1	22.65	260.29	2.58	1506.
3495	1.55	34.668	3440	27.764	45.6	1.28	32.5	24.96	336.73	3.07	1514.
4004	1.52	34.680	3937	27.776	45.7	1.20	31.0	27.28	425.30	3.27	1523.
4107	1.52	34.680	4037	27.776	46.0	1.18	30.9	27.75	444.75	3.38	1525.
4193	1.54	34.685	4127	27.779	46.2	1.19	30.6	28.18	462.88	3.34	1526.
4209	1.53	34.687	4137	27.781	45.9	1.18	30.4	28.23	464.90	3.36	1526.



OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50- 0.0 N, 145- 0.0 W GMT 18.9
 HYDROGRAPHIC CAST DATA
 REFERENCE NO. 73- 6- 20 DATE 23/ 8/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.50	32.452	0	24.542	340.6	12.50	340.4	0.0	0.0	6.42	1496.
10	12.47	32.457	10	24.551	339.8	12.47	339.4	0.34	0.02	6.40	1496.
24	12.46	32.458	24	24.554	340.0	12.46	339.1	0.84	0.11	6.43	1496.
29	9.64	32.497	29	25.083	289.6	9.64	288.8	1.00	0.15	7.04	1486.
49	7.25	32.535	49	25.470	252.9	7.25	251.9	1.51	0.36	7.13	1473.
74	6.10	32.591	74	25.664	234.6	6.09	233.5	2.12	0.74	6.83	1474.
100	5.42	32.730	99	25.855	216.6	5.41	215.3	2.69	1.25	6.69	1471.
124	5.03	33.108	123	26.198	184.1	5.02	182.6	3.17	1.80	5.86	1471.
149	4.95	33.510	148	26.525	153.5	4.94	151.6	3.59	2.39	4.97	1471.
175	4.77	33.685	174	26.684	138.6	4.76	136.6	3.97	3.01	4.51	1471.
200	4.62	33.777	199	26.773	130.3	4.60	128.1	4.31	3.66	3.62	1471.
251	4.33	33.835	249	26.851	123.3	4.31	120.7	4.95	5.12	2.44	1471.
302	4.08	33.887	300	26.918	117.3	4.06	114.2	5.56	6.86	1.85	1471.
404	3.86	34.021	401	27.047	105.8	3.83	102.0	6.70	10.94	1.25	1472.
505	3.70	34.100	501	27.126	99.0	3.66	94.4	7.73	15.73	0.96	1473.
605	3.60	34.188	600	27.206	92.1	3.56	86.8	8.63	21.13	0.68	1474.
783	3.19	34.299	776	27.333	80.8	3.14	74.6	10.22	31.96	0.62	1475.
996	2.90	34.374	986	27.419	73.5	2.83	66.4	11.85	46.75	0.58	1478.
1205	2.64	34.435	1193	27.491	67.3	2.56	59.5	13.32	63.27	0.71	1480.
1518	2.32	34.512	1501	27.580	59.6	2.22	51.0	15.29	90.63	0.87	1484.
2031	1.94	34.560	2006	27.649	53.9	1.80	44.3	18.18	143.00	1.49	1491.
2540	1.73	34.630	2506	27.721	47.9	1.55	37.2	20.76	202.96	2.09	1499.
3047	1.59	34.646	3003	27.744	46.5	1.36	34.7	23.13	270.58	2.62	1507.
3558	1.54	34.636	3502	27.740	47.9	1.26	34.8	25.54	351.95	2.84	1515.
4074	1.52	34.684	4005	27.779	45.6	1.19	30.6	27.96	445.88	3.31	1524.
4178	1.51	34.688	4107	27.783	45.4	1.17	30.2	28.44	465.90	0.0	1526.
4273	1.54	34.693	4199	27.785	45.9	1.18	29.9	28.86	484.33	3.42	1528.
4283	1.53	34.686	4209	27.780	46.2	1.17	30.4	28.91	486.39	3.43	1528.



DATE 30/ 8/73

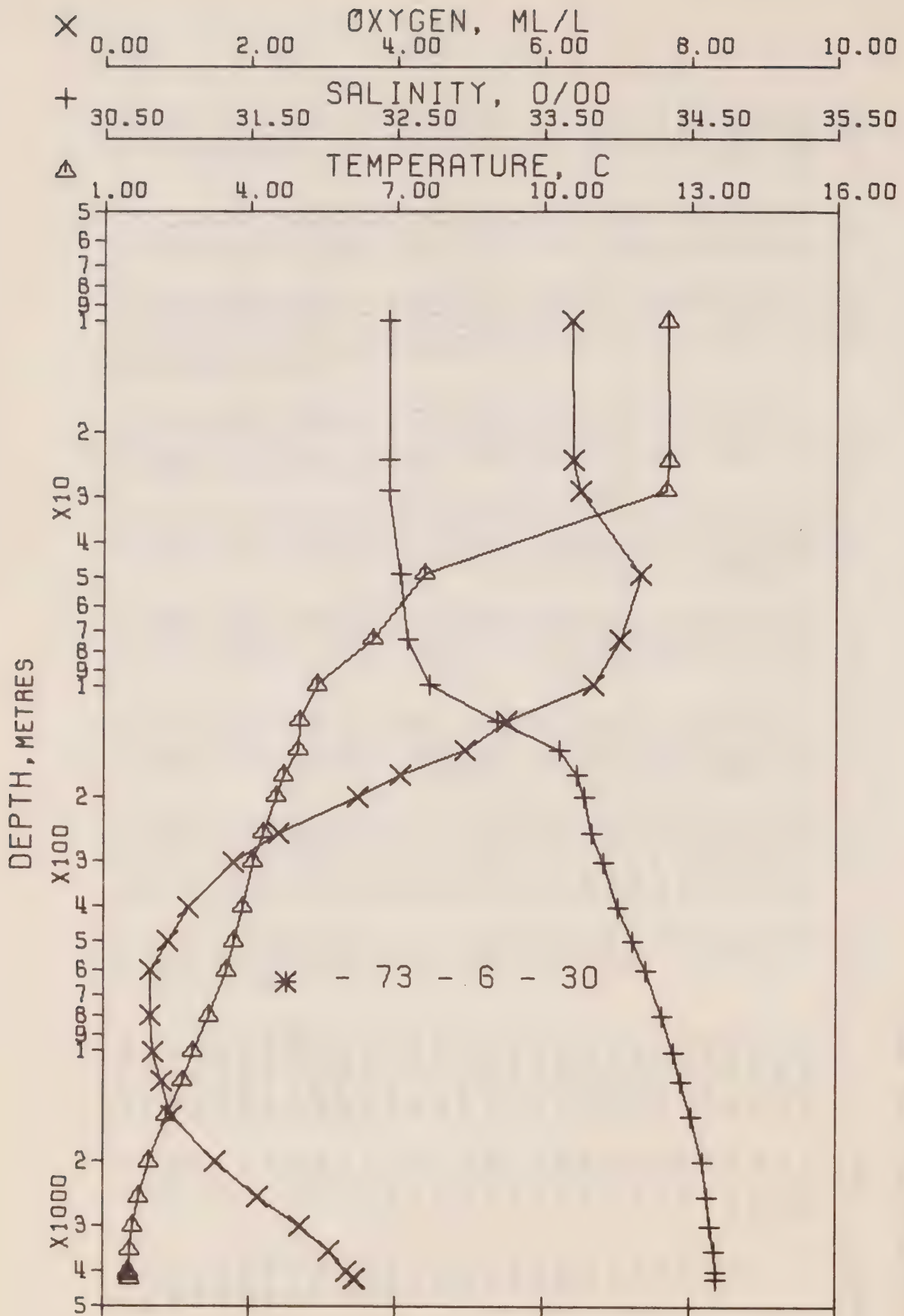
REFERENCE NO. 73- 6- 25

OFFSHORE OCEANOGRAPHY GROUP

POSITION 50- 0.0 N, 145- 0.0 W GMT 18.7

HYDROGRAPHIC CAST DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.57	32.465	0	24.539	340.9	12.57	340.7	0.0	0.0	6.33	1496.
9	12.51	32.466	9	24.551	339.9	12.51	339.5	0.31	0.01	6.30	1496.
24	12.35	32.465	24	24.580	337.4	12.35	336.6	0.83	0.10	6.38	1496.
29	10.74	32.481	29	24.886	308.4	10.74	307.5	0.99	0.15	6.76	1490.
48	7.50	32.553	48	25.450	254.8	7.50	253.9	1.52	0.35	7.21	1479.
73	6.18	32.596	73	25.658	235.2	6.17	234.0	2.13	0.74	6.91	1474.
99	5.31	32.904	98	26.005	202.3	5.30	201.0	2.68	1.22	6.36	1471.
124	5.10	33.381	123	26.406	164.5	5.09	162.9	3.14	1.74	5.53	1471.
149	5.25	33.704	148	26.645	142.3	5.24	140.3	3.52	2.27	5.08	1473.
175	5.06	33.779	174	26.726	134.8	5.05	132.6	3.88	2.87	4.58	1472.
201	4.70	33.824	200	26.802	127.7	4.68	125.4	4.23	3.53	3.61	1471.
254	4.34	33.861	252	26.870	121.6	4.32	118.8	4.88	5.04	2.54	1471.
306	4.12	33.913	304	26.935	115.8	4.10	112.7	5.50	6.81	1.90	1471.
408	3.85	34.016	405	27.044	106.1	3.82	102.3	6.63	10.92	1.26	1472.
505	3.69	34.108	501	27.133	98.3	3.65	93.8	7.62	15.53	0.83	1473.
610	3.53	34.190*	605	27.214	91.3	3.49	86.0	8.61	21.18	0.59	1474.
811	3.17	34.304	804	27.339	80.4	3.11	74.1	10.33	33.63	0.61	1476.
1014	2.87	34.371	1004	27.420	73.5	2.80	66.3	11.88	48.09	0.64	1478.
1216	2.60	34.444	1204	27.502	66.3	2.52	58.6	13.30	64.16	0.72	1480.
1522	2.29	34.516	1505	27.585	59.0	2.19	50.4	15.20	90.66	0.94	1484.
2035	1.94	34.572	2010	27.658	53.0	1.80	43.4	18.04	142.33	1.50	1491.
2549	1.72	34.620*	2515	27.714	48.6	1.54	37.8	20.64	203.10	2.03	1499.
3066	1.59	34.650	3021	27.747	46.3	1.36	34.4	23.08	272.74	2.67	1507.
3583	1.54	34.649	3526	27.750	47.1	1.26	33.8	25.49	354.79	2.92	1516.
3891	1.52	34.676	3827	27.773	45.7	1.21	31.4	26.92	409.18	3.31	1521.
4097	1.52	34.678	4028	27.775	46.1	1.19	31.1	27.87	447.65	3.37	1524.
4200	1.51	34.674	4128	27.772	46.5	1.16	31.3	28.34	467.75	3.47	1526.
4292	1.54	34.682	4218	27.776	46.7	1.18	30.7	28.78	486.66	3.56	1528.
4303	1.53	34.689	4228	27.783	46.0	1.17	30.2	28.83	488.75	3.45	1528.



DATE 5/ 9/73

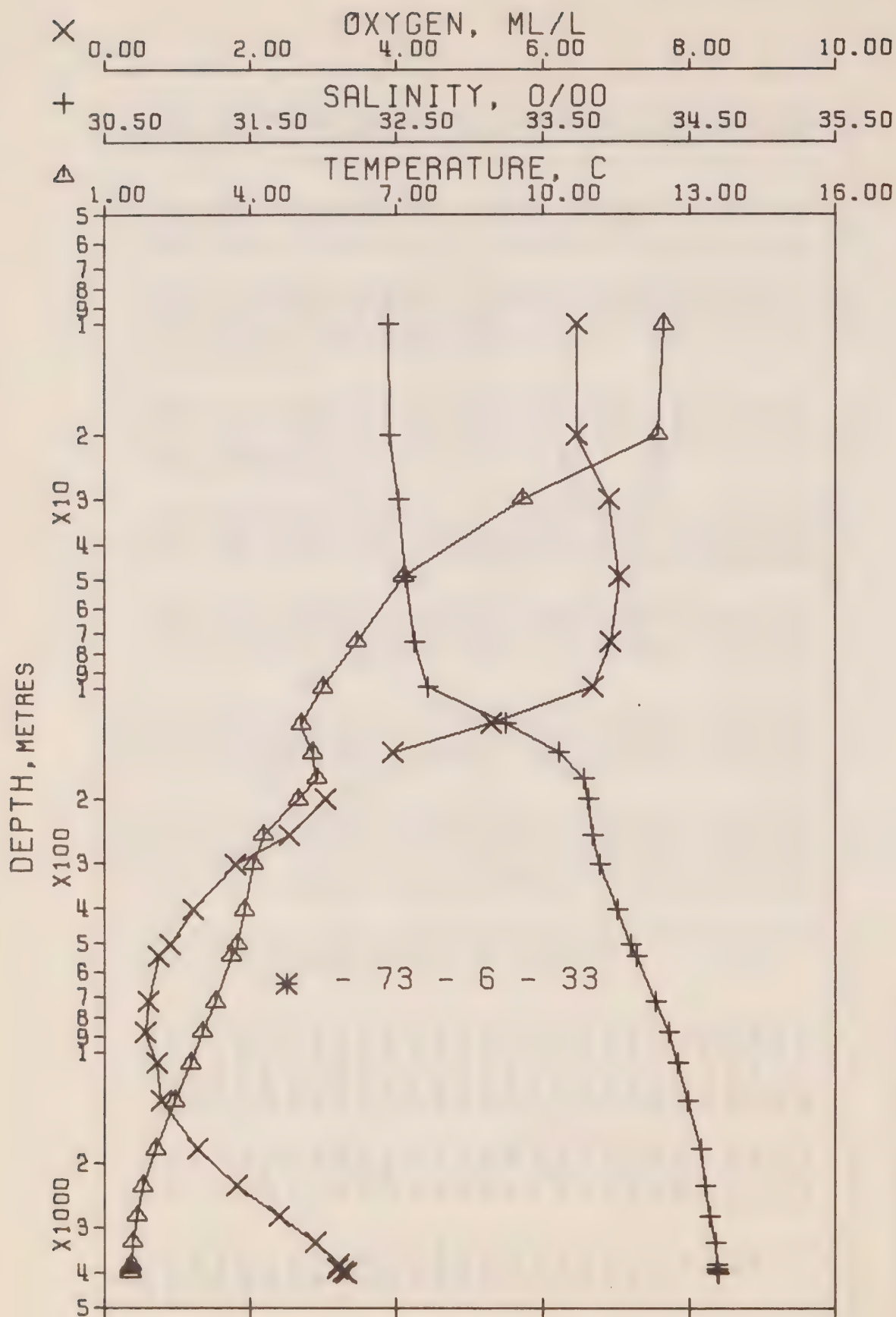
REFERENCE NO. 73- 6- 30

OFFSHORE OCEANOGRAPHY GROUP

POSITION 50- 0.0 N, 145- 0.0 W GMT 18.7

HYDROGRAPHIC CAST DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.56	32.456	0	24.533	341.3	12.56	341.1	0.0	0.0	6.34	1496.
10	12.53	32.450	10	24.535	341.5	12.53	341.0	0.34	0.02	6.37	1496.
24	12.54	32.455	24	24.537	341.6	12.54	340.7	0.82	0.10	6.39	1497.
29	12.50	32.455	29	24.544	341.0	12.50	340.0	1.00	0.15	6.50	1496.
49	7.56	32.532	49	25.425	257.2	7.56	256.2	1.61	0.39	7.32	1479.
74	6.53	32.579	74	25.600	240.8	6.52	239.6	2.22	0.78	7.03	1475.
100	5.38	32.734	99	25.863	215.8	5.37	214.5	2.80	1.29	6.68	1471.
125	5.03	33.195	124	26.267	177.7	5.02	176.1	3.29	1.86	5.51	1471.
150	5.00	33.608	149	26.597	146.7	4.99	144.8	3.70	2.42	4.93	1472.
176	4.70	33.730	175	26.728	134.5	4.69	132.4	4.06	3.03	4.05	1471.
201	4.54	33.783	200	26.787	129.0	4.52	126.8	4.39	3.67	3.47	1471.
254	4.28	33.829	252	26.851	123.3	4.26	120.7	5.05	5.20	2.40	1471.
305	4.06	33.913	303	26.941	115.2	4.04	112.1	5.66	6.94	1.78	1471.
407	3.86	34.008	404	27.037	106.8	3.83	102.9	6.79	11.04	1.16	1472.
506	3.66	34.114	502	27.141	97.5	3.62	93.1	7.80	15.74	0.89	1472.
608	3.51	34.200	603	27.224	90.3	3.47	85.1	8.76	21.17	0.64	1474.
810	3.15	34.308	803	27.344	79.9	3.09	73.6	10.47	33.54	0.65	1476.
1015	2.82	34.386	1005	27.436	71.9	2.75	64.8	12.01	47.90	0.69	1478.
1218	2.61	34.438	1206	27.496	66.9	2.53	59.0	13.42	63.94	0.80	1480.
1524	2.28	34.510	1507	27.581	59.3	2.18	50.9	15.34	90.78	0.94	1484.
2036	1.93	34.588	2011	27.672	51.8	1.79	42.0	18.15	141.81	1.53	1491.
2548	1.72	34.623	2514	27.716	48.3	1.54	37.6	20.70	201.31	2.11	1499.
3061	1.60	34.645	3016	27.742	46.8	1.37	34.8	23.13	270.81	2.71	1507.
3572	1.55	34.668	3516	27.764	45.8	1.27	32.5	25.49	350.70	3.10	1516.
4084	1.52	34.679	4015	27.775	46.0	1.19	31.0	27.81	441.01	3.33	1524.
4186	1.52	34.667*	4114	27.766	47.1	1.18	31.9	28.28	460.98	0.0	1526.
4278	1.54	34.677	4204	27.772	47.0	1.18	31.2	28.72	479.95	3.45	1528.
4288	1.53	34.682	4214	27.777	46.5	1.17	30.7	28.77	482.05	3.44	1528.



OFFSHORE OCEANOGRAPHY GROUP
 POSITION 50- 0.0 N, 145- 0.0 W GMT 19.7
 HYDROGRAPHIC CAST DATA

REFERENCE NO. 73- 6- 33

DATE 11/ 9/73

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.51	32.450	0	24.538	340.9	12.51	340.7	0.0	0.0	6.42	1496.
10	12.45	32.449	10	24.549	340.1	12.45	339.7	0.34	0.02	6.46	1496.
20	12.34	32.464	20	24.582	337.2	12.34	336.5	0.69	0.07	6.46	1496.
30	9.59	32.517	30	25.107	287.3	9.59	286.5	1.00	0.15	6.90	1486.
49	7.14	32.574	49	25.516	248.5	7.14	247.6	1.50	0.35	7.05	1477.
74	6.18	32.626	74	25.682	232.9	6.17	231.8	2.10	0.73	6.91	1474.
100	5.50	32.716	99	25.835	218.6	5.49	217.2	2.67	1.24	6.68	1472.
126	5.04	33.246	125	26.306	174.0	5.03	172.4	3.19	1.83	5.29	1471.
151	5.29	33.614	150	26.569	149.5	5.28	147.5	3.59	2.40	3.96	1473.
177	5.38	33.783	176	26.692	138.2	5.37	135.8	3.97	3.03	0.0	1474.
202	4.99	33.813	201	26.761	131.8	4.97	129.2	4.30	3.68	3.05	1473.
254	4.26	33.844	252	26.865	122.0	4.24	119.3	4.95	5.19	2.54	1471.
306	4.07	33.895	304	26.925	116.6	4.05	113.6	5.58	6.98	1.79	1471.
408	3.89	34.011	405	27.036	106.9	3.86	103.0	6.72	11.11	1.22	1472.
507	3.73	34.099	503	27.122	99.4	3.69	94.8	7.74	15.89	0.91	1473.
547	3.61	34.144	542	27.170	95.1	3.57	90.3	8.12	17.95	0.75	1473.
733	3.27	34.273	726	27.305	83.2	3.22	77.3	9.76	28.65	0.60	1475.
883	3.02	34.359	875	27.397	75.2	2.96	68.6	10.95	38.44	0.56	1476.
1078	2.77	34.417	1067	27.465	69.4	2.70	62.0	12.35	52.42	0.71	1479.
1370	2.45	34.490	1355	27.551	62.0	2.36	53.8	14.26	76.25	0.78	1482.
1855	2.05	34.576	1833	27.653	53.4	1.92	43.9	17.03	121.81	1.27	1489.
2343	1.78	34.614	2313	27.704	49.1	1.62	38.9	19.51	174.96	1.82	1496.
2837	1.65	34.638	2797	27.733	47.2	1.44	35.8	21.89	237.68	2.40	1503.
3341	1.56	34.676	3290	27.770	44.7	1.31	32.0	24.20	310.37	2.90	1512.
3857	1.53	34.688	3794	27.782	44.9	1.22	30.6	26.50	394.86	3.21	1520.
3963	1.52	34.687	3897	27.782	45.1	1.20	30.5	26.97	413.80	3.21	1522.
4057	1.54	34.686	3989	27.780	45.7	1.21	30.6	27.41	431.79	3.28	1524.
4069	1.52	34.700	4000	27.792	44.5	1.19	29.5	27.47	433.90	3.32	1524.

RESULTS OF STD OBSERVATIONS

(P-73-6)

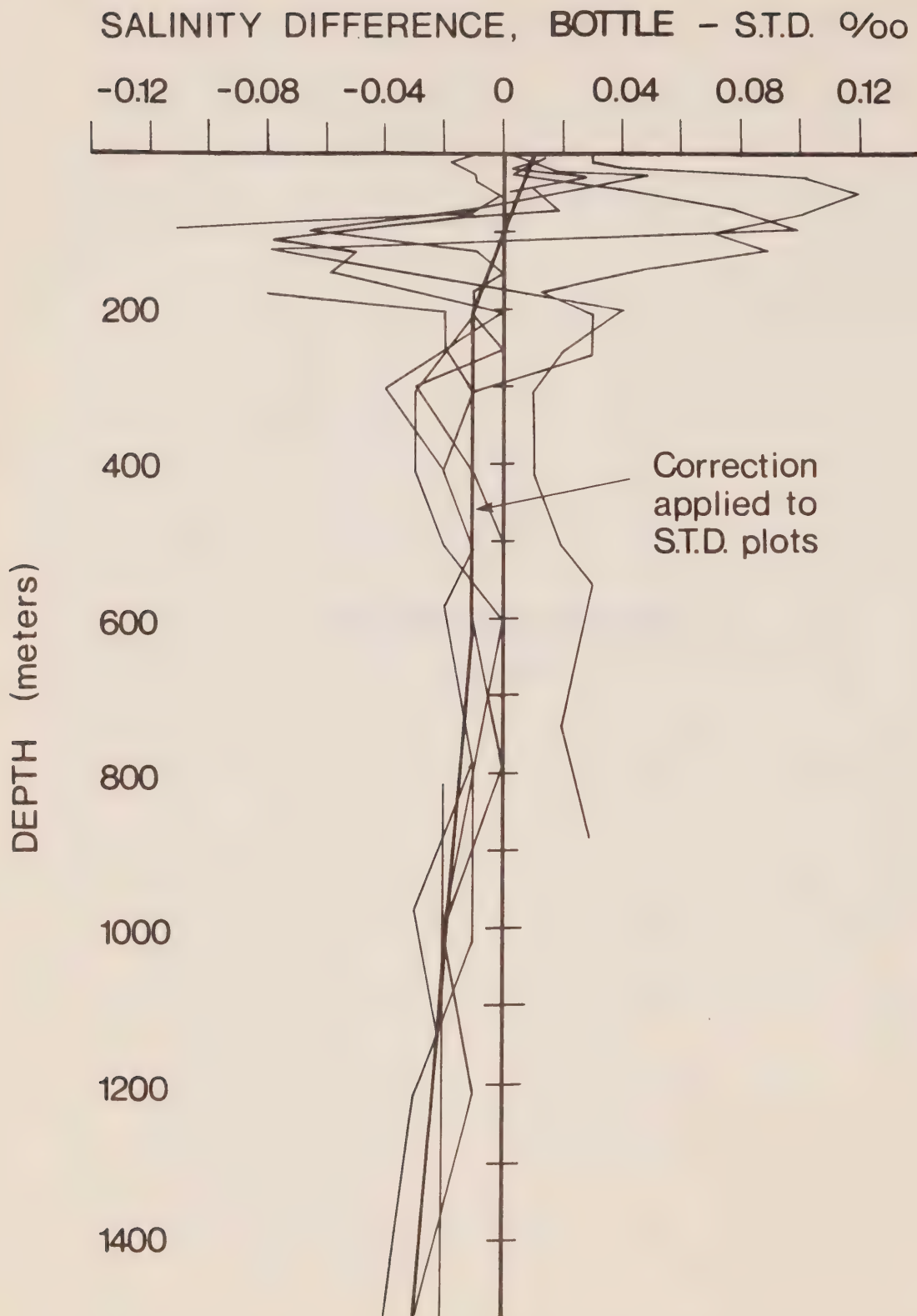


Figure 12 Salinity difference between hydro data and STD. P-73-6.

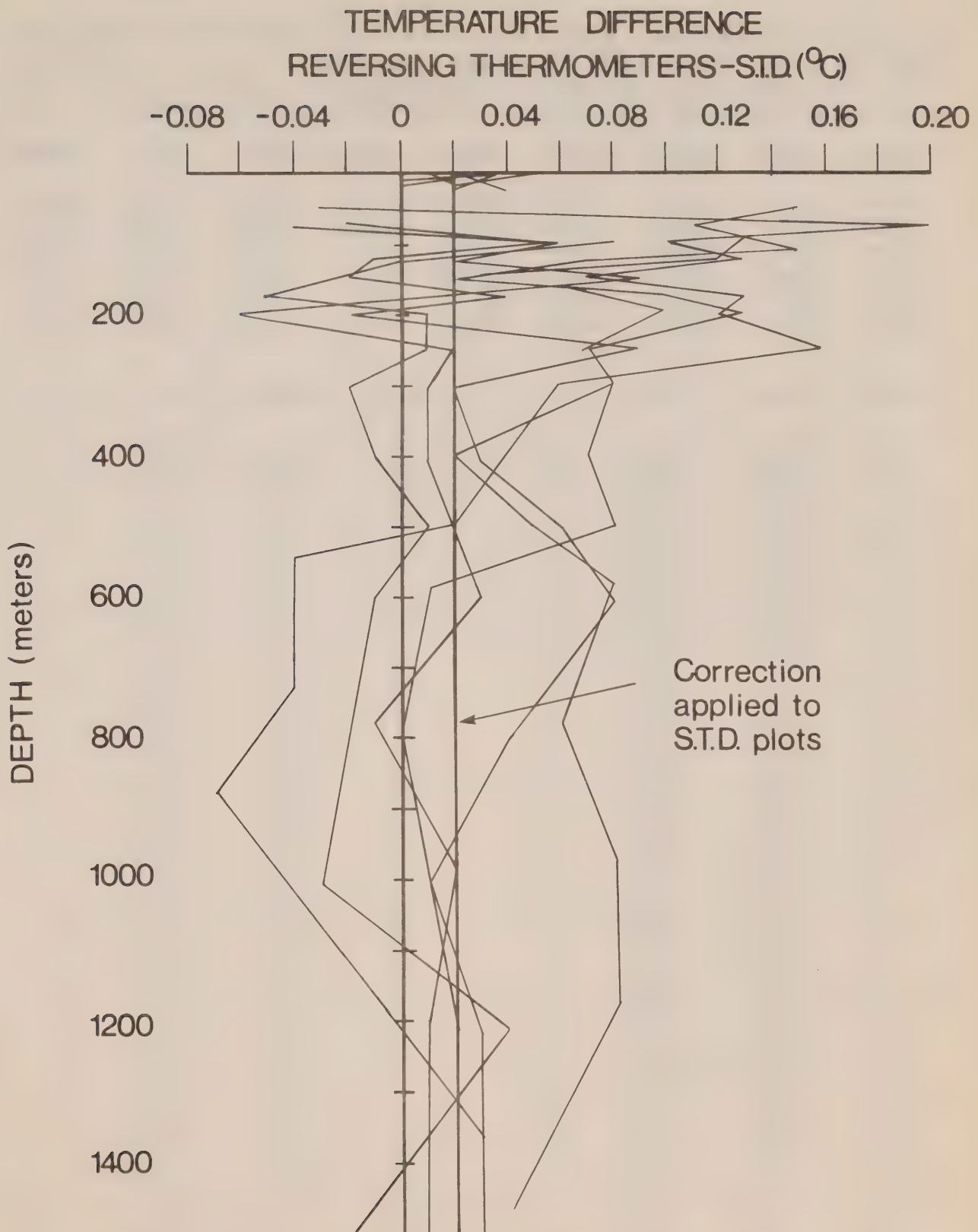


Figure 13 Temperature difference between hydro data and STD. P-73-6.

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 6- 1

DATE 3/ 8/73

POSITION 48-23.0N, 125-33.0W GMT 22.4

RESULTS OF STP CAST 70 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.45	31.62	0	24.09	383.2	0.0	0.0	1491.
10	11.33	31.61	10	24.11	382.3	0.38	0.02	1491.
20	8.97	31.86	20	24.69	326.6	0.74	0.07	1483.
30	8.01	32.68	30	25.48	252.0	1.03	0.15	1480.
50	7.29	33.20	50	25.99	203.9	1.48	0.33	1479.
75	6.67	33.56	75	26.35	169.2	1.94	0.62	1477.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	11.45	31.62	44.	7.54	33.07
4.	11.45	31.61	45.	7.47	33.11
7.	11.44	31.61	46.	7.43	33.15
8.	11.39	31.61	47.	7.42	33.16
10.	11.33	31.61	48.	7.38	33.16
11.	11.24	31.61	49.	7.34	33.19
13.	10.98	31.61	51.	7.25	33.21
13.	10.67	31.61	51.	7.25	33.28
13.	10.56	31.61	57.	7.25	33.29
14.	9.92	31.61	58.	7.14	33.29
15.	9.74	31.61	58.	7.07	33.39
16.	9.22	31.69	60.	6.97	33.40
18.	9.10	31.80	61.	6.97	33.43
19.	9.07	31.83	63.	6.95	33.43
19.	9.02	31.86	64.	6.93	33.45
20.	8.97	31.86	64.	6.89	33.45
22.	8.93	31.88	66.	6.88	33.45
22.	8.88	31.94	67.	6.77	33.49
25.	8.59	32.10	67.	6.76	33.52
26.	8.25	32.36	68.	6.74	33.52
27.	8.19	32.50	69.	6.72	33.52
29.	8.06	32.56	70.	6.71	33.54
29.	8.04	32.65	73.	6.69	33.54
30.	8.01	32.68	74.	6.68	33.56
31.	7.96	32.84	75.	6.67	33.56
32.	8.00	32.84	76.	6.60	33.56
33.	8.00	32.85	77.	6.54	33.59
33.	8.01	32.87	77.	6.51	33.60
35.	7.93	32.89	79.	6.47	33.63
37.	7.76	32.94	80.	6.41	33.64
38.	7.77	32.97	82.	6.36	33.69
39.	7.78	32.99	83.	6.33	33.70
39.	7.76	33.01	84.	6.31	33.71
40.	7.68	33.06	86.	6.31	33.72
42.	7.64	33.07	90.	6.30	33.73

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 6- 2

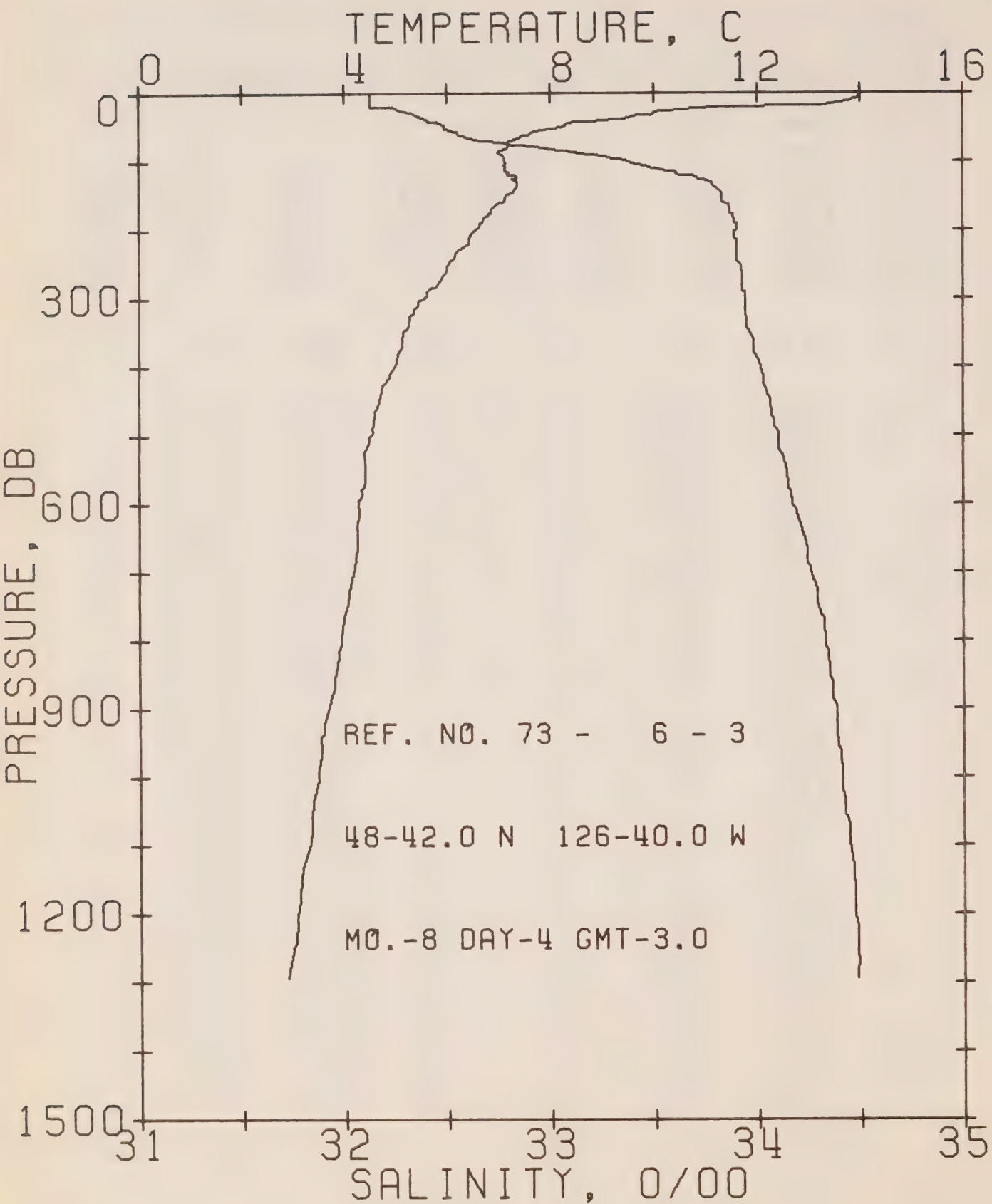
DATE 4/ 8/73

POSITION 48-38.0N, 126- 0.0W GMT 0.2

RESULTS OF STP CAST 64 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. FN	SOUND
0	13.21	31.75	0	23.86	405.1	0.0	0.0	1498.
10	10.62	32.44	10	24.87	309.1	0.38	0.02	1490.
20	8.83	32.57	20	25.27	271.5	0.67	0.06	1483.
30	7.89	32.85	30	25.63	237.7	0.92	0.13	1480.
50	7.39	33.12	50	25.91	211.1	1.37	0.31	1479.
75	6.40	33.82	75	26.59	146.5	1.83	0.59	1476.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	13.21	31.75	42.	7.67	33.02
3.	13.20	31.75	43.	7.67	33.03
5.	13.18	31.75	43.	7.63	33.04
5.	13.09	31.75	46.	7.51	33.04
6.	13.01	31.76	49.	7.42	33.10
7.	11.98	31.76	50.	7.39	33.12
8.	11.24	32.23	51.	7.39	33.13
8.	10.82	32.29	53.	7.32	33.17
10.	10.62	32.44	56.	7.24	33.20
10.	10.54	32.48	57.	7.22	33.23
12.	10.35	32.48	58.	7.21	33.26
13.	10.19	32.48	59.	7.21	33.27
14.	9.96	32.49	60.	7.17	33.28
15.	9.61	32.49	61.	7.07	33.32
17.	9.09	32.53	62.	7.06	33.38
19.	9.00	32.56	63.	7.02	33.44
21.	8.67	32.59	64.	6.99	33.47
21.	8.54	32.60	66.	6.82	33.54
22.	8.42	32.66	67.	6.74	33.59
23.	8.35	32.68	67.	6.70	33.64
25.	8.13	32.70	69.	6.61	33.68
26.	8.03	32.73	71.	6.55	33.71
27.	8.02	32.76	74.	6.41	33.80
29.	7.98	32.80	76.	6.39	33.84
30.	7.89	32.85	76.	6.38	33.85
30.	7.88	32.87	79.	6.37	33.87
35.	7.81	32.95	81.	6.36	33.88
36.	7.79	32.95	84.	6.36	33.89
37.	7.78	32.97	85.	6.36	33.90
39.	7.78	32.99	87.	6.35	33.91
40.	7.76	32.99	88.	6.35	33.91
41.	7.72	33.01	89.	6.35	33.91



OFFSHORE OCEANOGRAPHY GROUP

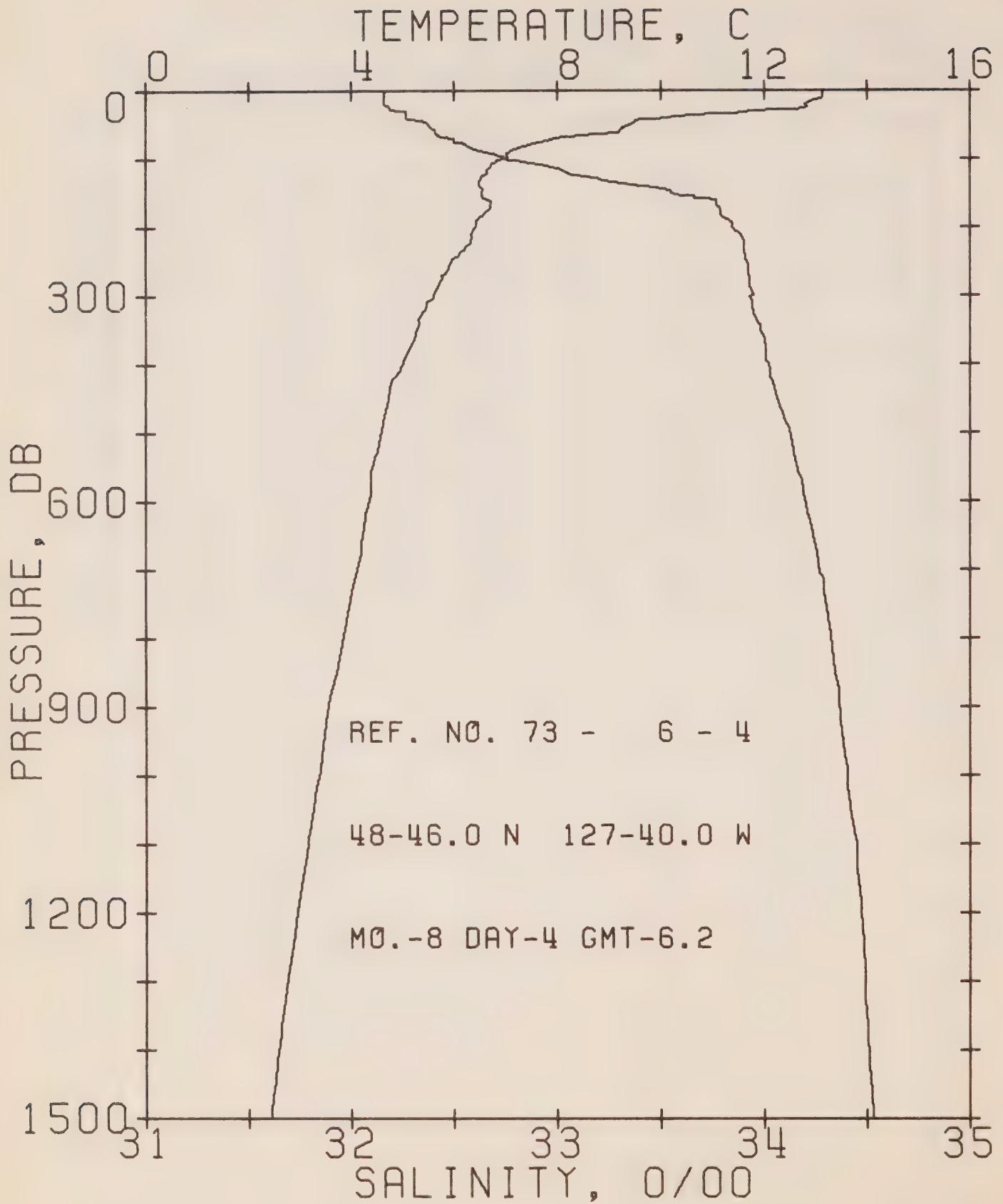
REFERENCE NO. 73- 6- 3

DATE 4/ 8/73

POSITION 48-42.0N, 126-40.0W GMT 3.0

RESULTS OF STP CAST 265 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.96	32.13	0	24.00	391.6	0.0	0.0	1500.
10	13.86	32.13	10	24.02	390.2	0.39	0.02	1500.
20	11.65	32.13	20	24.45	349.6	0.77	0.08	1493.
30	9.99	32.34	30	24.90	306.7	1.09	0.16	1487.
50	8.18	32.49	50	25.30	268.8	1.67	0.39	1481.
75	7.20	32.82	75	25.70	231.3	2.30	0.79	1478.
100	7.13	33.37	99	26.14	189.7	2.82	1.25	1479.
125	7.34	33.71	124	26.38	167.4	3.26	1.76	1481.
150	7.17	33.93	149	26.50	156.8	3.67	2.33	1481.
175	6.85	33.87	174	26.57	149.9	4.05	2.96	1480.
200	6.56	33.90	199	26.64	144.3	4.42	3.66	1479.
225	6.34	33.90	223	26.67	141.7	4.77	4.44	1479.
250	6.04	33.91	248	26.71	137.3	5.12	5.28	1478.
300	5.57	33.94	298	26.79	130.1	5.79	7.15	1477.
400	4.96	34.01	397	26.92	118.5	7.03	11.58	1476.
500	4.50	34.10	496	27.04	107.7	8.16	15.75	1476.
600	4.27	34.17	595	27.12	100.9	9.21	22.60	1477.
800	3.92	34.33	793	27.29	86.6	11.08	35.89	1479.
1000	3.47	34.41	991	27.39	77.2	12.71	50.83	1480.
1200	3.05	34.47	1188	27.48	69.4	14.17	67.15	1482.



OFFSHORE OCEANOGRAPHY GROUP

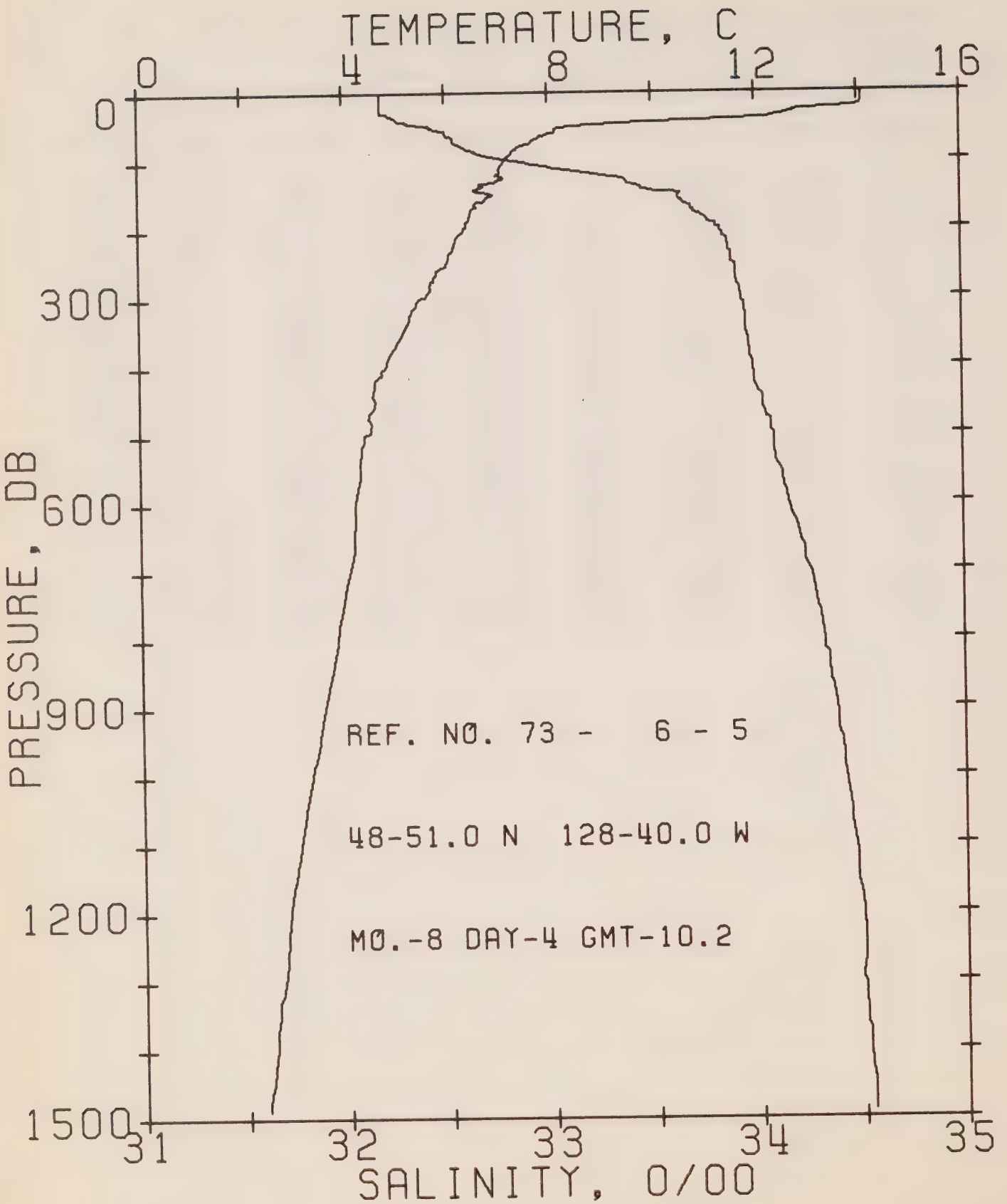
REFERENCE NO. 73- 6- 4

DATE 4/ 8/73

POSITION 48-46.0N, 127-40.0W GMT 6.2

RESULTS OF STP CAST 184 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.11	32.17	0	24.21	372.4	0.0	0.0	1498.
10	13.11	32.16	10	24.20	373.6	0.37	0.02	1498.
20	12.77	32.16	20	24.26	367.5	0.74	0.08	1497.
30	11.90	32.22	30	24.48	347.5	1.11	0.17	1494.
50	9.42	32.38	50	25.03	295.3	1.74	0.42	1486.
75	7.68	32.50	75	25.38	261.5	2.45	0.87	1480.
100	7.02	32.74	99	25.67	234.9	3.06	1.42	1478.
125	6.54	33.11	124	26.02	201.5	3.60	2.04	1477.
150	6.53	33.55	149	26.36	169.2	4.06	2.68	1478.
175	6.66	33.79	174	26.53	153.6	4.46	3.34	1479.
200	6.42	33.84	199	26.61	146.6	4.83	4.05	1478.
225	6.28	33.90	224	26.67	141.0	5.19	4.83	1478.
250	5.94	33.91	248	26.73	136.2	5.54	5.67	1477.
300	5.61	33.95	298	26.80	129.9	6.20	7.53	1477.
400	4.99	34.02	397	26.92	118.5	7.45	11.96	1476.
500	4.57	34.12	496	27.05	106.8	8.57	17.11	1476.
600	4.33	34.20	595	27.14	99.5	9.60	22.88	1477.
800	3.84	34.32	793	27.29	86.5	11.46	36.06	1478.
1000	3.36	34.40	991	27.40	76.7	13.08	50.92	1480.
1200	2.94	34.47	1188	27.49	68.0	14.52	67.07	1481.



OFFSHORE OCEANOGRAPHY GROUP

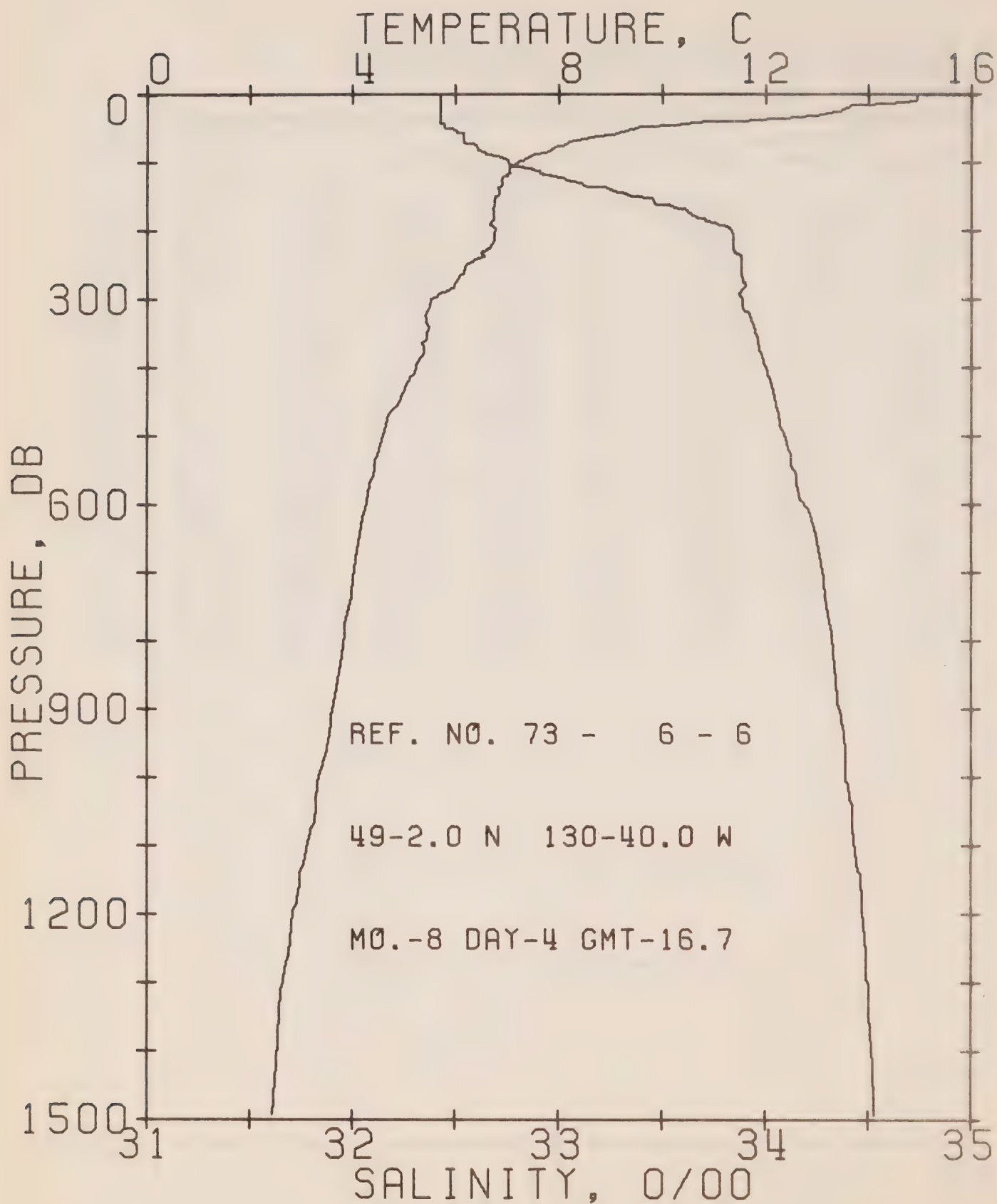
REFERENCE NO. 73- 6- 5

DATE 4/ 8/73

POSITION 48-51.0N, 128-40.0W GMT 10.2

RESULTS OF STP CAST 254 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.07	32.19	0	24.03	389.3	0.0	0.0	1501.
10	14.07	32.19	10	24.03	389.8	0.39	0.02	1501.
20	14.04	32.19	20	24.03	389.5	0.78	0.08	1501.
30	12.74	32.19	30	24.29	364.9	1.15	0.17	1497.
50	9.61	32.42	50	25.18	280.2	1.82	0.44	1483.
75	7.64	32.56	75	25.44	256.5	2.48	0.86	1480.
100	7.15	32.83	99	25.72	230.3	3.09	1.41	1478.
125	7.13	33.36	124	26.13	190.8	3.62	2.01	1479.
150	6.91	33.63	149	26.38	168.2	4.07	2.64	1479.
175	6.49	33.70	174	26.49	157.9	4.48	3.32	1478.
200	6.34	33.83	199	26.61	146.6	4.86	4.05	1478.
225	6.15	33.87	224	26.66	141.7	5.22	4.83	1478.
250	6.00	33.88	248	26.69	139.3	5.57	5.68	1478.
300	5.56	33.93	298	26.79	130.8	6.25	7.56	1477.
400	4.81	33.98	397	26.91	119.3	7.49	11.99	1475.
500	4.41	34.08	496	27.03	108.4	8.63	17.20	1476.
600	4.20	34.15	595	27.11	101.5	9.68	23.09	1476.
800	3.82	34.32	793	27.29	86.4	11.55	36.39	1478.
1000	3.28	34.42	991	27.42	74.6	13.16	51.07	1479.
1200	2.82	34.49	1188	27.52	64.9	14.55	66.64	1481.



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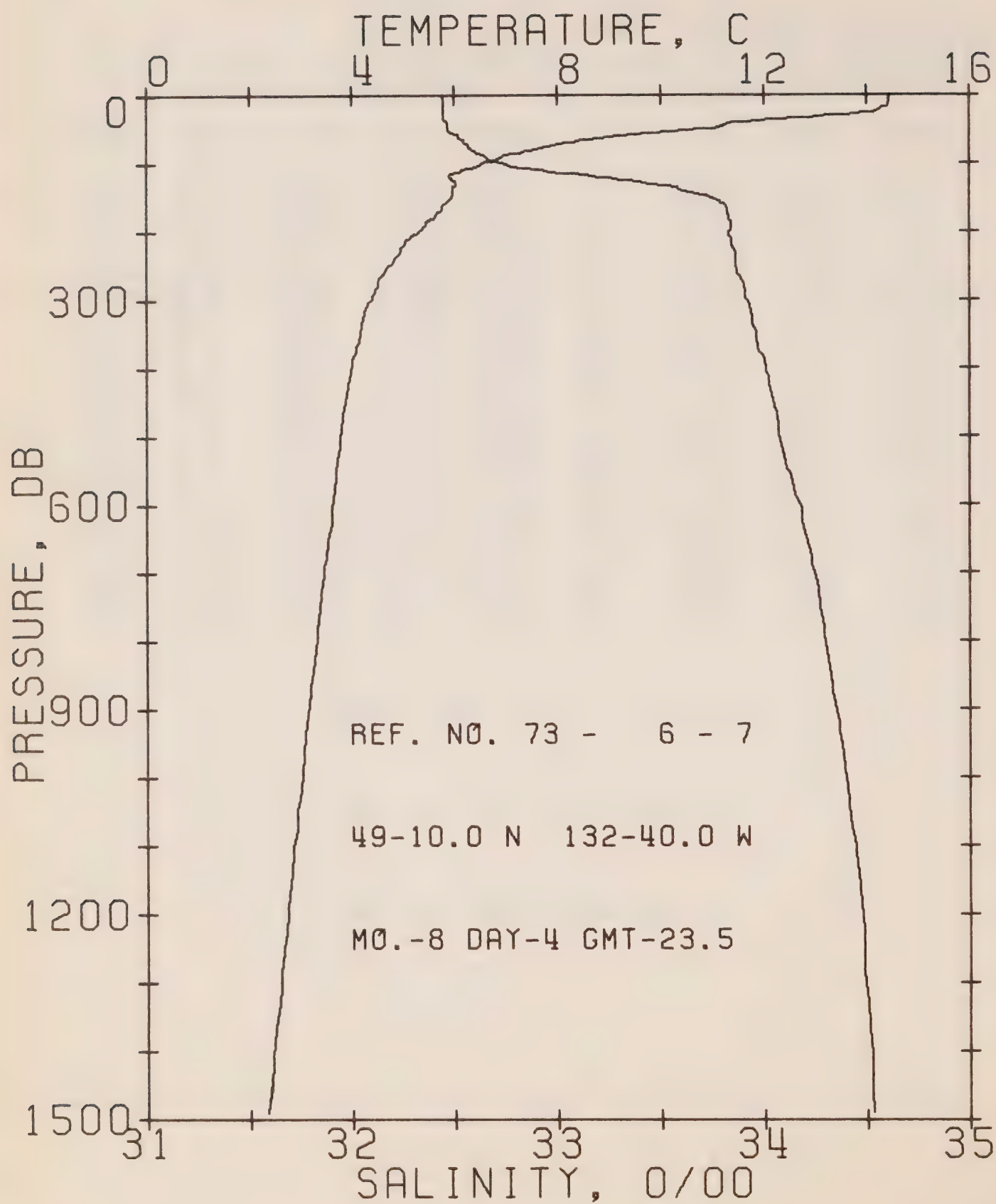
REFERENCE NO. 73- 6- 6

DATE 4/ 8/73

POSITION 49- 2.0N, 130-40.0W GMT 16.7

RESULTS OF STP CAST 240 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.93	32.43	0	24.03	388.9	0.0	0.0	1504.
10	14.91	32.43	10	24.04	389.0	0.39	0.02	1504.
20	13.60	32.43	20	24.31	363.3	0.76	0.08	1500.
30	13.06	32.43	30	24.42	353.2	1.12	0.17	1498.
50	9.51	32.46	50	25.08	290.6	1.77	0.43	1486.
75	8.11	32.60	75	25.40	260.0	2.46	0.87	1481.
100	7.21	32.75	99	25.64	237.1	3.08	1.42	1479.
125	6.90	33.03	124	25.91	212.2	3.64	2.06	1478.
150	6.79	33.35	149	26.17	187.5	4.14	2.76	1478.
175	6.75	33.63	174	26.40	166.3	4.58	3.48	1479.
200	6.76	33.83	199	26.56	151.9	4.97	4.24	1480.
225	6.66	33.84	224	26.58	150.4	5.35	5.06	1480.
250	6.22	33.88	248	26.66	142.1	5.72	5.94	1479.
300	5.55	33.89	298	26.75	133.9	6.41	7.89	1477.
400	5.23	34.00	397	26.88	122.6	7.70	12.46	1477.
500	4.59	34.09	496	27.03	109.4	8.85	17.76	1476.
600	4.25	34.18	595	27.14	99.6	9.90	23.61	1477.
800	3.81	34.32	793	27.29	86.0	11.73	36.64	1478.
1000	3.33	34.39	991	27.39	77.1	13.36	51.59	1480.
1200	2.82	34.47	1188	27.50	66.6	14.80	67.68	1481.



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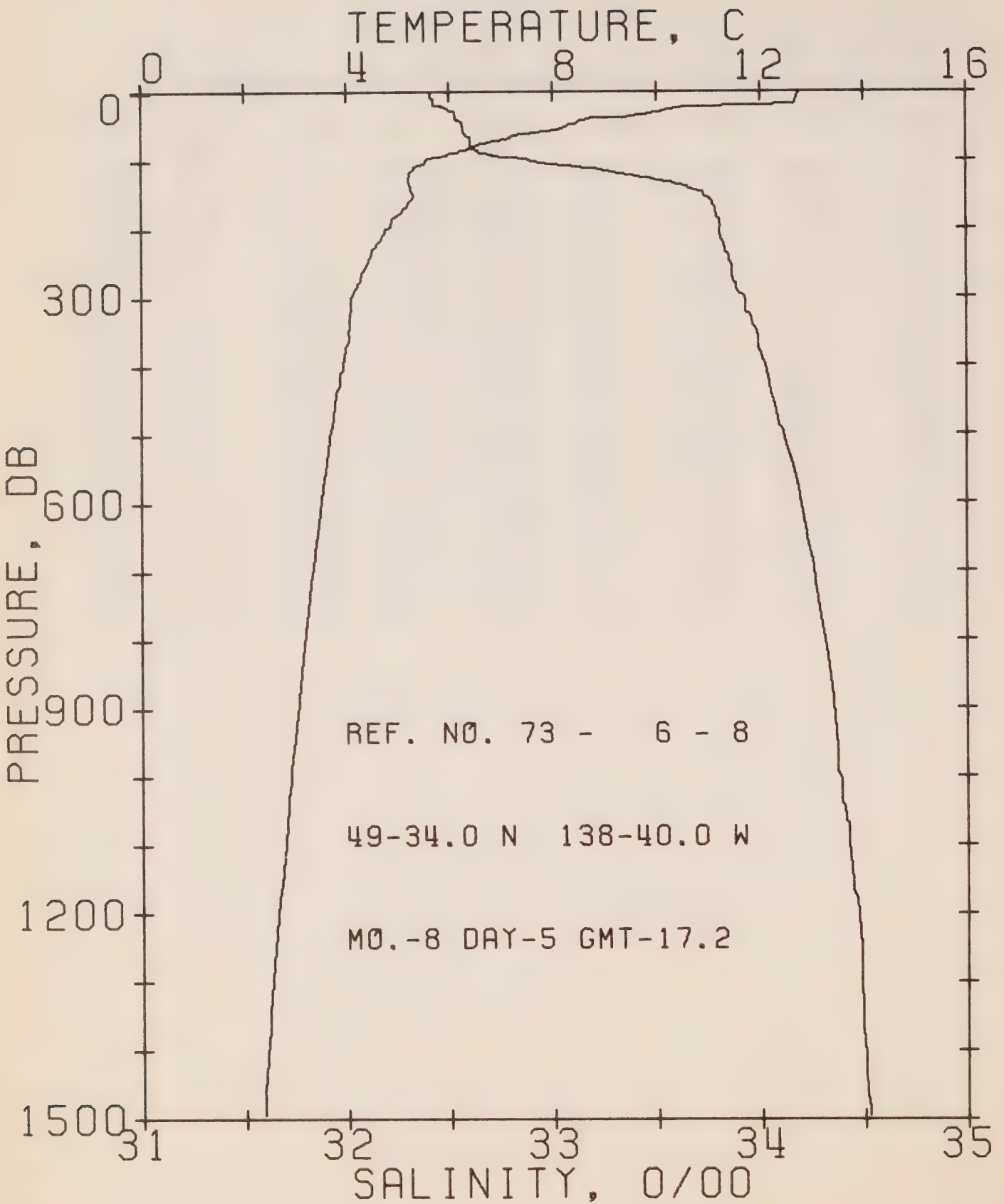
REFERENCE NO. 73- 6- 7

DATE 4/ 8/73

POSITION 49-10.0N, 132-40.0W GMT 23.5

RESULTS OF STP CAST 201 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.43	32.44	0	24.15	378.1	0.0	0.0	1502.
10	14.42	32.45	10	24.16	377.6	0.38	0.02	1503.
20	14.27	32.45	20	24.19	375.0	0.75	0.08	1502.
30	13.60	32.45	30	24.32	362.1	1.13	0.17	1500.
50	11.02	32.47	50	24.83	314.3	1.79	0.44	1492.
75	7.88	32.57	75	25.41	259.4	2.49	0.88	1481.
100	6.58	32.71	99	25.70	231.9	3.10	1.43	1476.
125	5.57	33.29	124	26.23	181.1	3.62	2.02	1475.
150	5.94	33.73	149	26.58	148.7	4.03	2.59	1476.
175	5.64	33.82	174	26.69	138.5	4.39	3.18	1475.
200	5.32	33.84	199	26.74	133.5	4.72	3.83	1474.
225	4.96	33.85	223	26.79	128.9	5.05	4.54	1473.
250	4.73	33.86	248	26.83	125.9	5.37	5.31	1472.
300	4.36	33.91	298	26.91	118.5	5.98	7.01	1472.
400	3.99	34.01	397	27.02	108.3	7.11	11.04	1472.
500	3.76	34.07	496	27.10	101.8	8.16	15.84	1473.
600	3.62	34.17	595	27.19	93.6	9.14	21.34	1474.
800	3.30	34.29	793	27.32	82.5	10.89	33.81	1476.
1000	2.99	34.39	990	27.43	73.1	12.45	48.01	1478.
1200	2.72	34.47	1188	27.51	65.5	13.83	63.49	1480.



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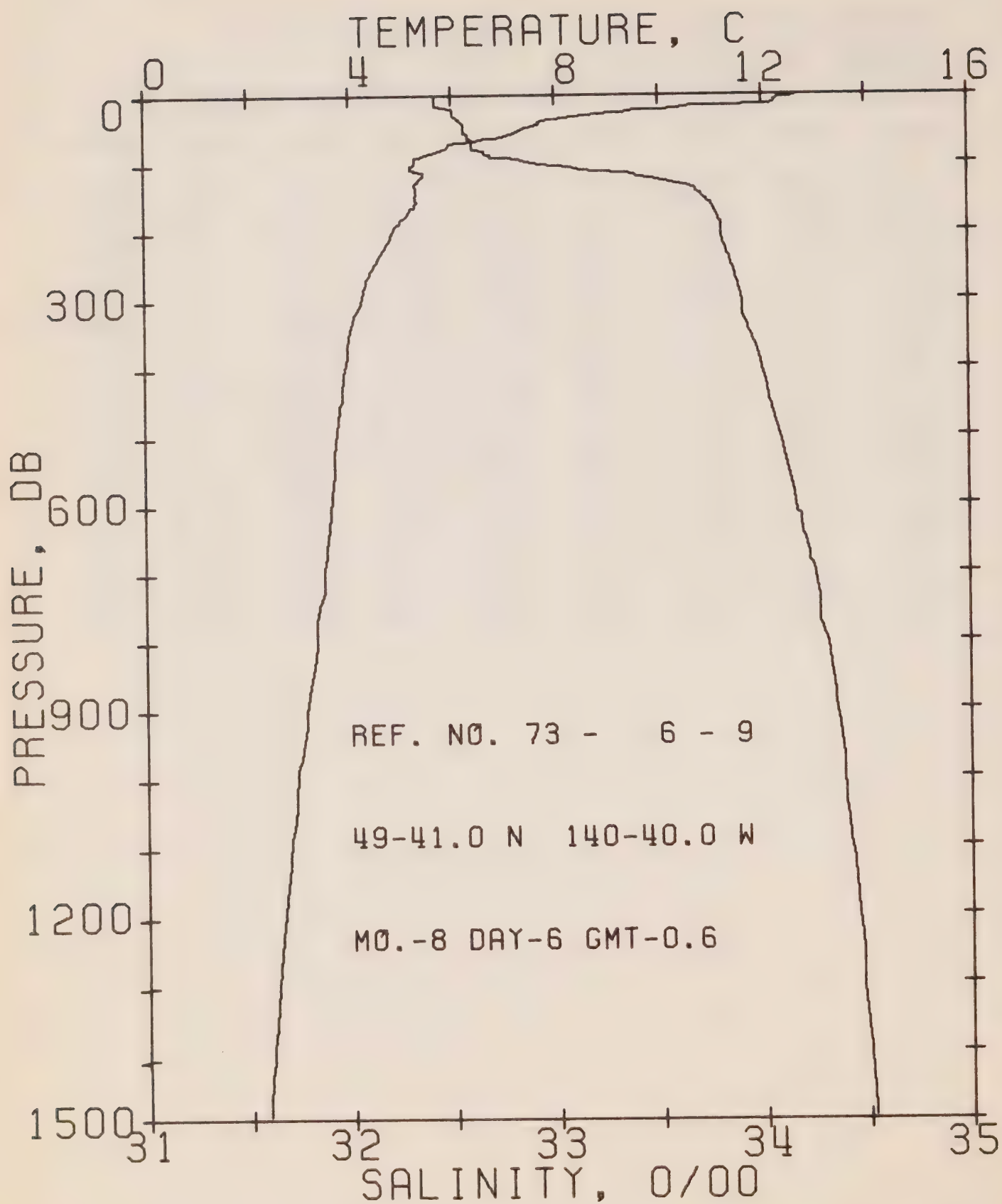
REFERENCE NO. 73- 6- 8

DATE 5/ 8/73

POSITION 49-34.0N, 138-40.0W GMT 17.2

RESULTS OF STP CAST 193 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.74	32.41	0	24.46	347.8	0.0	0.0	1497.
10	12.68	32.42	10	24.48	346.6	0.35	0.02	1497.
20	12.05	32.42	20	24.60	335.2	0.69	0.07	1495.
30	10.07	32.53	30	25.04	293.9	1.00	0.15	1488.
50	8.27	32.56	50	25.34	264.9	1.55	0.37	1482.
75	6.72	32.60	75	25.59	241.6	2.19	0.77	1476.
100	5.36	32.88	99	25.96	206.7	2.76	1.29	1472.
125	5.20	33.44	124	26.44	161.2	3.22	1.81	1472.
150	5.30	33.73	149	26.66	141.2	3.59	2.33	1473.
175	5.08	33.78	174	26.72	134.9	3.94	2.90	1473.
200	4.81	33.81	199	26.78	130.3	4.27	3.53	1472.
225	4.58	33.82	223	26.81	127.0	4.59	4.23	1471.
250	4.40	33.85	248	26.86	122.7	4.90	4.99	1471.
300	4.07	33.92	298	26.95	114.7	5.50	6.66	1471.
400	3.91	34.02	397	27.04	106.4	6.61	10.61	1472.
500	3.67	34.11	496	27.13	98.2	7.63	15.30	1472.
600	3.49	34.19	595	27.22	90.6	8.57	20.56	1473.
800	3.17	34.30	793	27.34	80.2	10.28	32.70	1475.
1000	2.88	34.38	990	27.42	73.0	11.80	46.64	1478.
1200	2.63	34.47	1188	27.52	65.0	13.18	62.08	1480.



OFFSHORE OCEANOGRAPHY GROUP

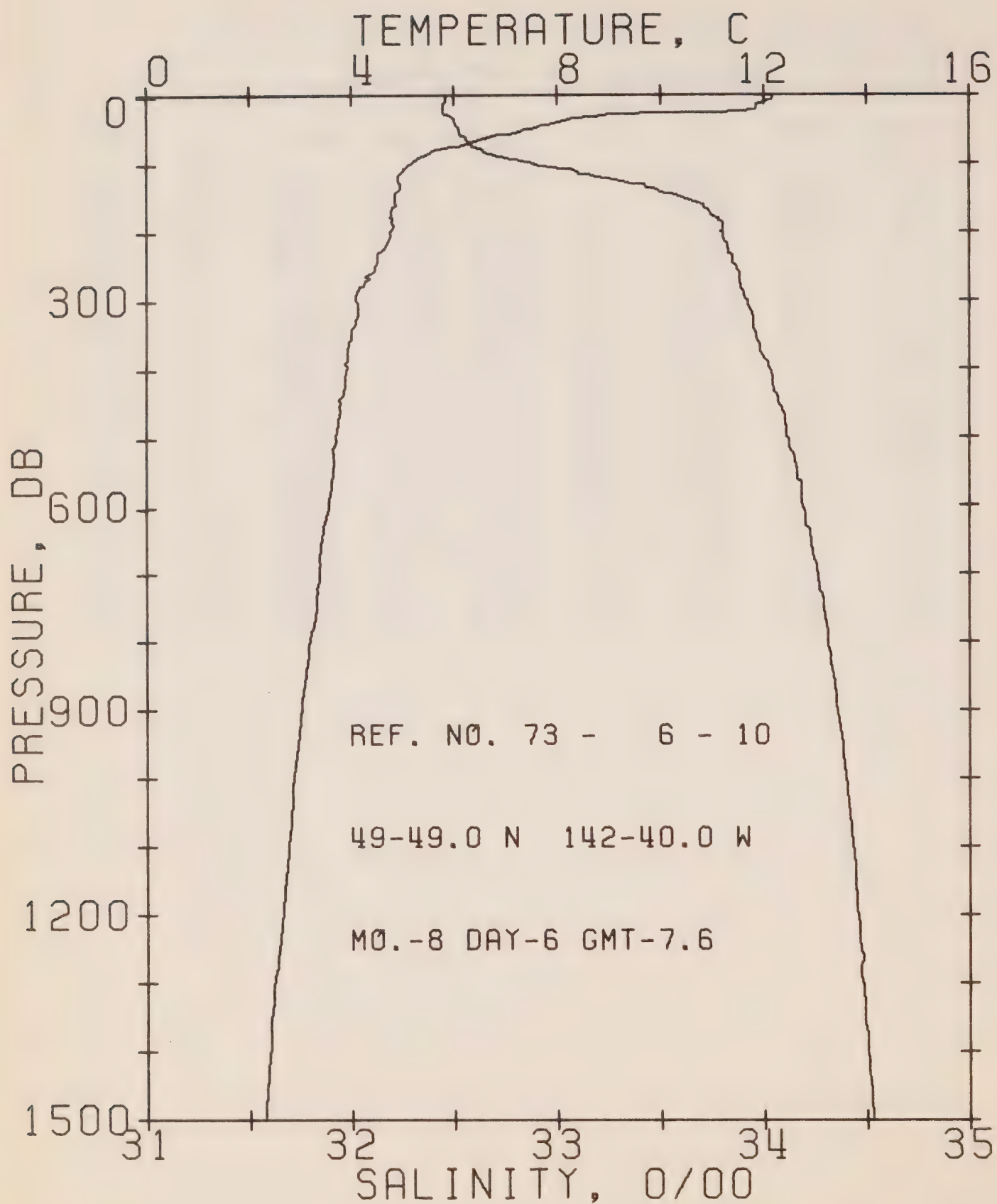
REFERENCE NO. 73- 6- 9

DATE 6/ 8/73

POSITION 49-41.0N, 140-40.0W GMT 0.6

RESULTS OF STP CAST 186 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.65	32.42	0	24.49	345.5	0.0	0.0	1496.
10	12.23	32.42	10	24.57	338.2	0.34	0.02	1495.
20	10.32	32.50	20	24.97	299.9	0.67	0.07	1489.
30	8.59	32.51	30	25.26	272.9	0.95	0.14	1482.
50	7.40	32.56	50	25.47	253.1	1.47	0.35	1478.
75	5.91	32.60	75	25.69	231.7	2.08	0.74	1473.
100	5.27	32.88	99	25.99	203.4	2.63	1.23	1471.
125	5.35	33.51	124	26.48	157.7	3.08	1.74	1473.
150	5.28	33.71	149	26.65	141.9	3.45	2.25	1473.
175	5.14	33.78	174	26.72	135.7	3.80	2.83	1473.
200	4.85	33.80	199	26.77	131.1	4.13	3.46	1472.
225	4.66	33.82	223	26.80	127.8	4.45	4.17	1472.
250	4.47	33.85	248	26.85	123.8	4.77	4.93	1471.
300	4.23	33.90	298	26.91	118.0	5.37	6.62	1471.
400	3.91	33.99	397	27.02	108.4	6.50	10.64	1472.
500	3.73	34.08	496	27.11	100.6	7.55	15.43	1473.
600	3.62	34.16	595	27.18	94.7	8.52	20.90	1474.
800	3.30	34.30	793	27.33	81.6	10.28	33.40	1476.
1000	2.90	34.38	990	27.43	73.0	11.82	47.52	1478.
1200	2.64	34.45	1188	27.50	66.2	13.22	63.13	1480.



OFFSHORE OCEANOGRAPHY GROUP

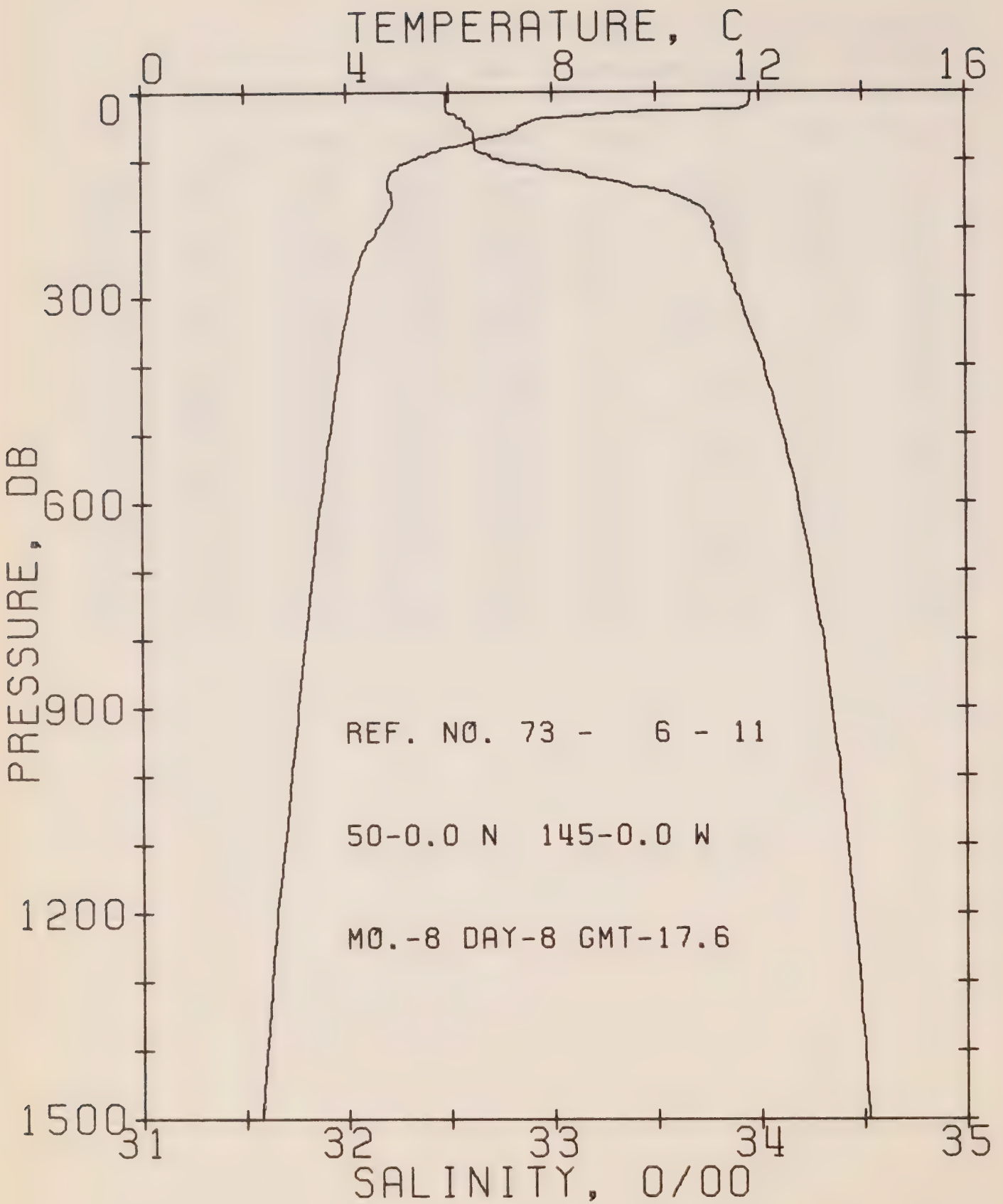
REFERENCE NO. 73- 6- 10

DATE 6/ 8/73

POSITION 49-49.0N, 142-40.0W GMT 7.6

RESULTS OF STP CAST 233 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.15	32.46	0	24.61	333.4	0.0	0.0	1495.
10	12.05	32.46	10	24.63	332.2	0.33	0.02	1495.
20	11.83	32.45	20	24.67	329.1	0.66	0.07	1494.
30	8.91	32.48	30	25.18	280.0	0.97	0.15	1484.
50	7.46	32.52	50	25.43	256.8	1.51	0.36	1478.
75	6.07	32.59	75	25.67	234.3	2.12	0.75	1473.
100	5.19	32.87	99	26.00	203.2	2.67	1.24	1471.
125	4.92	33.27	124	26.34	170.5	3.13	1.77	1470.
150	4.85	33.60	149	26.61	145.5	3.52	2.32	1471.
175	4.77	33.74	174	26.73	134.5	3.87	2.89	1471.
200	4.77	33.79	199	26.77	130.7	4.20	3.52	1472.
225	4.63	33.32	223	26.81	127.1	4.52	4.22	1472.
250	4.45	33.86	248	26.86	122.8	4.83	4.97	1471.
300	4.08	33.91	298	26.94	115.2	5.43	6.64	1471.
400	3.90	34.02	397	27.04	106.0	6.54	10.60	1472.
500	3.68	34.11	496	27.14	98.0	7.56	15.25	1472.
600	3.54	34.18	595	27.21	91.7	8.50	20.54	1474.
800	3.18	34.31	793	27.34	79.9	10.21	32.67	1476.
1000	2.86	34.39	990	27.44	71.6	11.72	46.50	1478.
1200	2.63	34.45	1188	27.51	65.8	13.09	61.85	1480.



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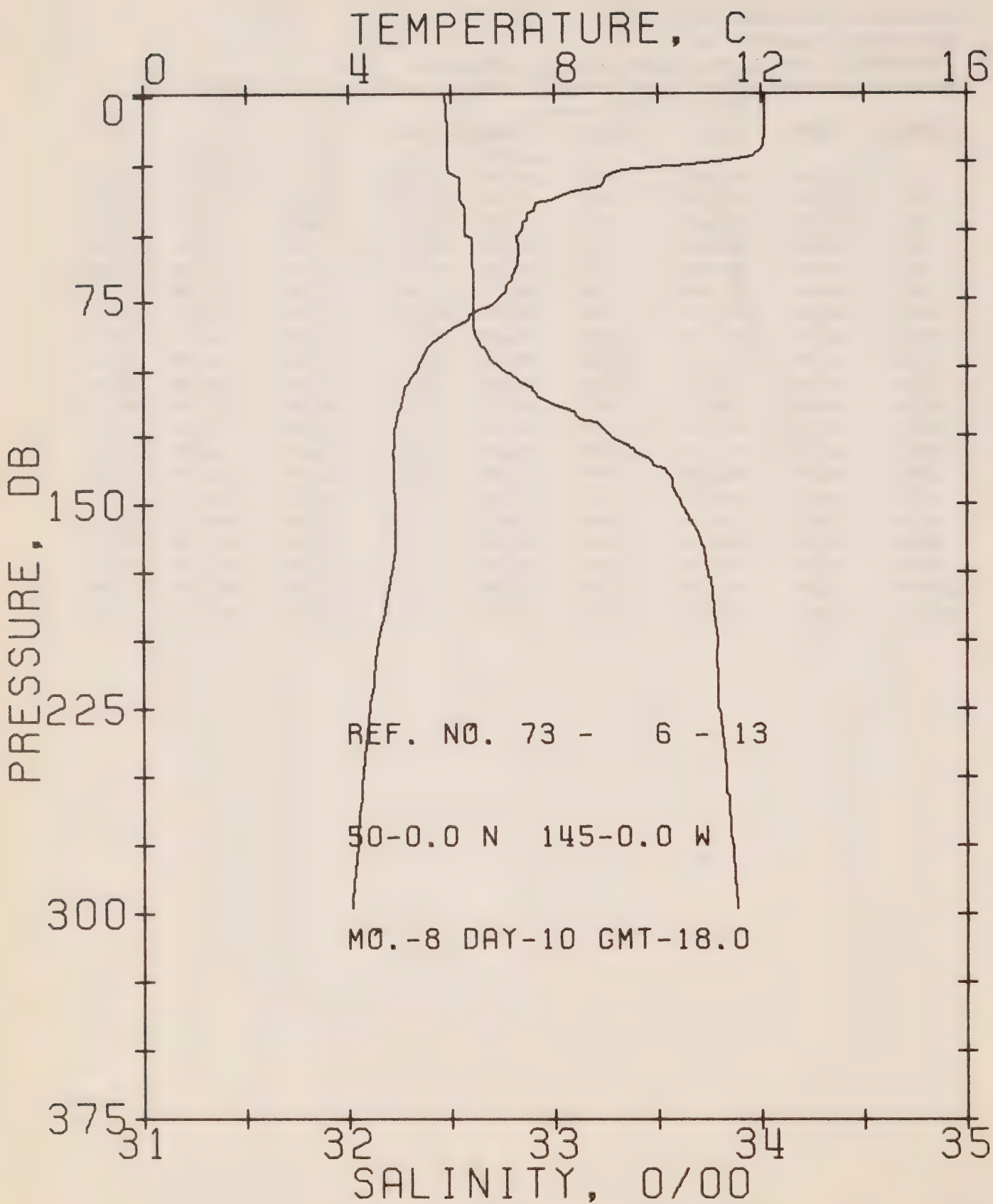
REFERENCE NO. 73- 6- 11

DATE 8/ 8/73

POSITION 50- 0.0N, 145- 0.0W GMT 17.6

RESULTS OF STP CAST 159 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.85	32.48	0	24.69	326.7	0.0	0.0	1494.
10	11.80	32.49	10	24.70	325.4	0.33	0.02	1494.
20	11.79	32.49	20	24.70	325.5	0.65	0.07	1494.
30	9.41	32.50	30	25.12	285.8	0.97	0.15	1485.
50	7.41	32.58	50	25.48	251.6	1.49	0.36	1478.
75	6.42	32.62	75	25.65	236.0	2.10	0.75	1475.
100	5.29	32.75	99	25.89	213.6	2.67	1.25	1471.
125	4.83	33.17	124	26.27	177.4	3.15	1.80	1470.
150	4.87	33.58	149	26.59	147.5	3.55	2.37	1471.
175	4.82	33.73	174	26.72	135.5	3.91	2.95	1471.
200	4.60	33.77	199	26.77	130.6	4.24	3.58	1471.
225	4.37	33.80	223	26.82	126.0	4.56	4.28	1470.
250	4.24	33.83	248	26.86	122.5	4.87	5.03	1470.
300	4.04	33.90	298	26.93	115.9	5.46	6.70	1470.
400	3.83	34.02	397	27.05	105.5	6.57	10.63	1471.
500	3.65	34.11	496	27.14	97.8	7.59	15.31	1472.
600	3.47	34.18	595	27.21	91.1	8.53	20.59	1473.
800	3.17	34.30	793	27.34	80.4	10.25	32.77	1475.
1000	2.87	34.38	990	27.43	72.5	11.77	46.76	1478.
1200	2.59	34.45	1193	27.51	65.6	13.16	62.25	1480.



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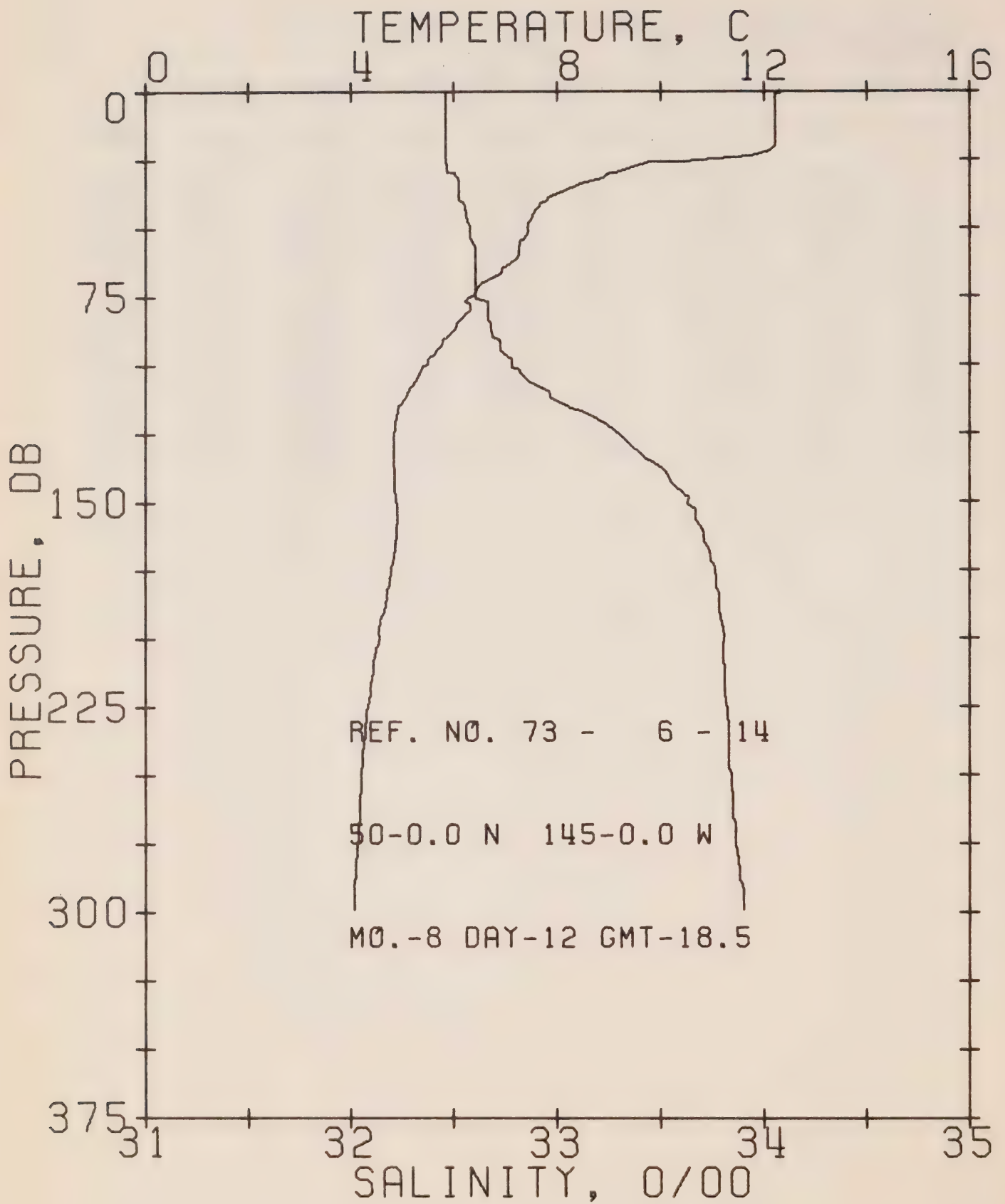
REFERENCE NO. 73- 6- 13

DATE 10/ 8/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.0

RESULTS OF STP CAST 124 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.05	32.47	0	24.64	330.9	0.0	0.0	1494.
10	12.04	32.48	10	24.65	330.6	0.33	0.02	1495.
20	12.01	32.48	20	24.66	330.1	0.66	0.07	1495.
30	9.01	32.52	30	25.20	278.3	0.97	0.15	1484.
50	7.35	32.57	50	25.48	251.5	1.49	0.36	1478.
75	6.92	32.61	75	25.57	243.3	2.11	0.75	1477.
100	5.35	32.74	99	25.87	215.2	2.69	1.26	1471.
125	4.87	33.27	124	26.34	170.3	3.17	1.81	1470.
150	4.91	33.61	149	26.61	145.5	3.56	2.35	1471.
175	4.83	33.74	174	26.72	135.2	3.90	2.93	1471.
200	4.56	33.79	199	26.79	128.7	4.23	3.56	1471.
225	4.40	33.79	223	26.81	127.3	4.55	4.25	1471.
250	4.27	33.33	243	26.85	123.1	4.87	5.01	1470.



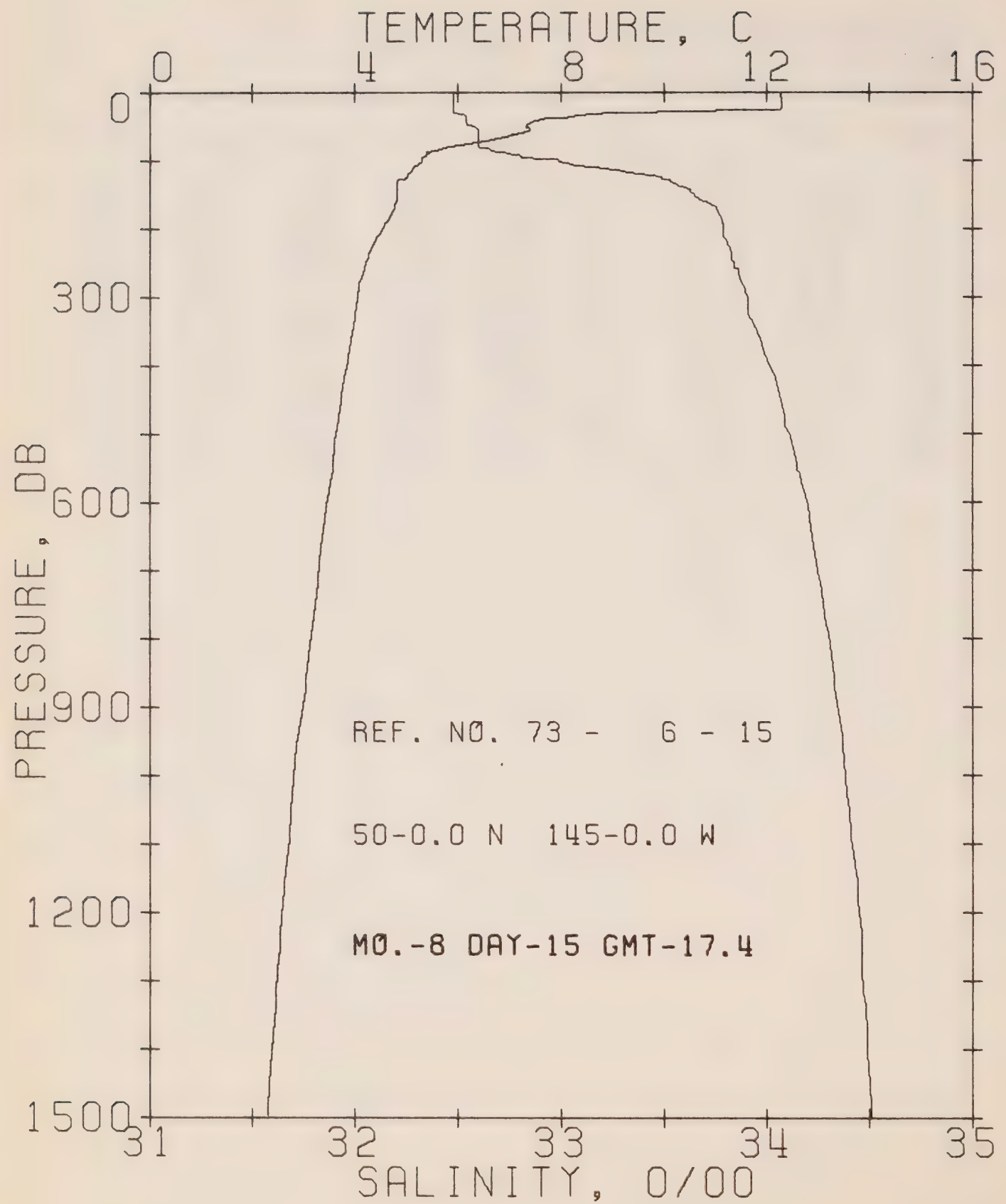
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 6- 14 DATE 12/ 8/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.5

RESULTS OF STP CAST 119 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.28	32.46	0	24.59	335.7	0.0	0.0	1495.
10	12.22	32.46	10	24.60	335.0	0.34	0.02	1495.
20	12.21	32.46	20	24.60	335.1	0.67	0.07	1495.
30	9.11	32.47	30	25.15	283.5	0.98	0.15	1484.
50	7.45	32.58	50	25.48	252.2	1.51	0.36	1478.
75	6.38	32.61	75	25.64	236.6	2.12	0.75	1475.
100	5.48	32.78	99	25.89	213.5	2.68	1.25	1472.
125	4.84	33.29	124	26.37	168.3	3.16	1.90	1470.
150	4.89	33.63	149	26.63	143.5	3.55	2.34	1471.
175	4.77	33.76	174	26.75	132.8	3.89	2.91	1471.
200	4.55	33.31	199	26.81	127.1	4.22	3.53	1471.
225	4.32	33.82	223	26.84	124.3	4.53	4.21	1470.
250	4.19	33.84	243	26.87	121.5	4.84	4.96	1470.



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REFERENCE NO. 73- 6- 15

DATE 15/ 8/73

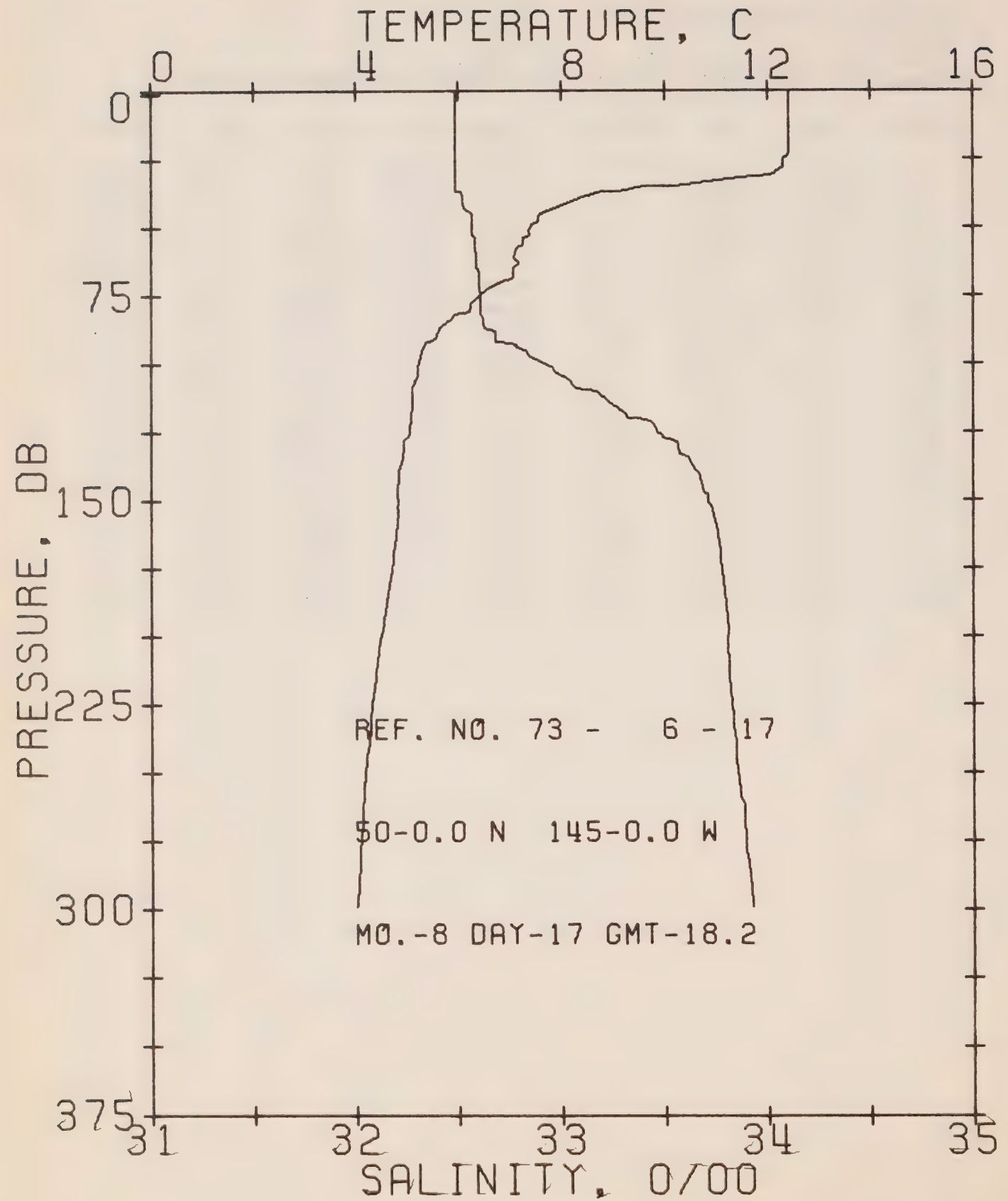
POSITION 50- 0.0N, 145- 0.0W

GMT 17.4

RESULTS OF STP CAST

164 POINTS TAKEN FROM ANALCG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.27	32.48	0	24.61	334.1	0.0	0.0	1495.
10	12.28	32.48	10	24.61	334.7	0.33	0.02	1495.
20	12.28	32.48	20	24.61	335.0	0.67	0.07	1496.
30	9.54	32.48	30	25.09	289.3	0.99	0.15	1486.
50	7.35	32.57	50	25.48	251.6	1.51	0.36	1478.
75	6.30	32.60	75	25.65	236.4	2.13	0.75	1474.
100	5.32	32.98	99	26.07	196.4	2.68	1.24	1471.
125	5.00	33.49	124	26.50	155.3	3.12	1.75	1471.
150	4.34	33.65	149	26.65	141.7	3.49	2.26	1471.
175	4.73	33.76	174	26.75	132.5	3.83	2.83	1471.
200	4.53	33.79	199	26.79	128.5	4.16	3.45	1471.
225	4.35	33.81	223	26.83	125.0	4.48	4.14	1470.
250	4.21	33.84	248	26.87	121.7	4.78	4.89	1470.
300	4.04	33.90	298	26.94	115.5	5.38	6.55	1470.
400	3.84	34.01	397	27.04	106.4	6.49	10.52	1471.
500	3.64	34.11	496	27.14	97.5	7.51	15.17	1472.
600	3.46	34.20	595	27.23	90.1	8.45	20.43	1473.
800	3.15	34.30	793	27.34	80.1	10.15	32.55	1475.
1000	2.81	34.38	990	27.43	71.9	11.67	46.41	1477.
1200	2.58	34.45	1188	27.51	65.7	13.04	61.80	1480.



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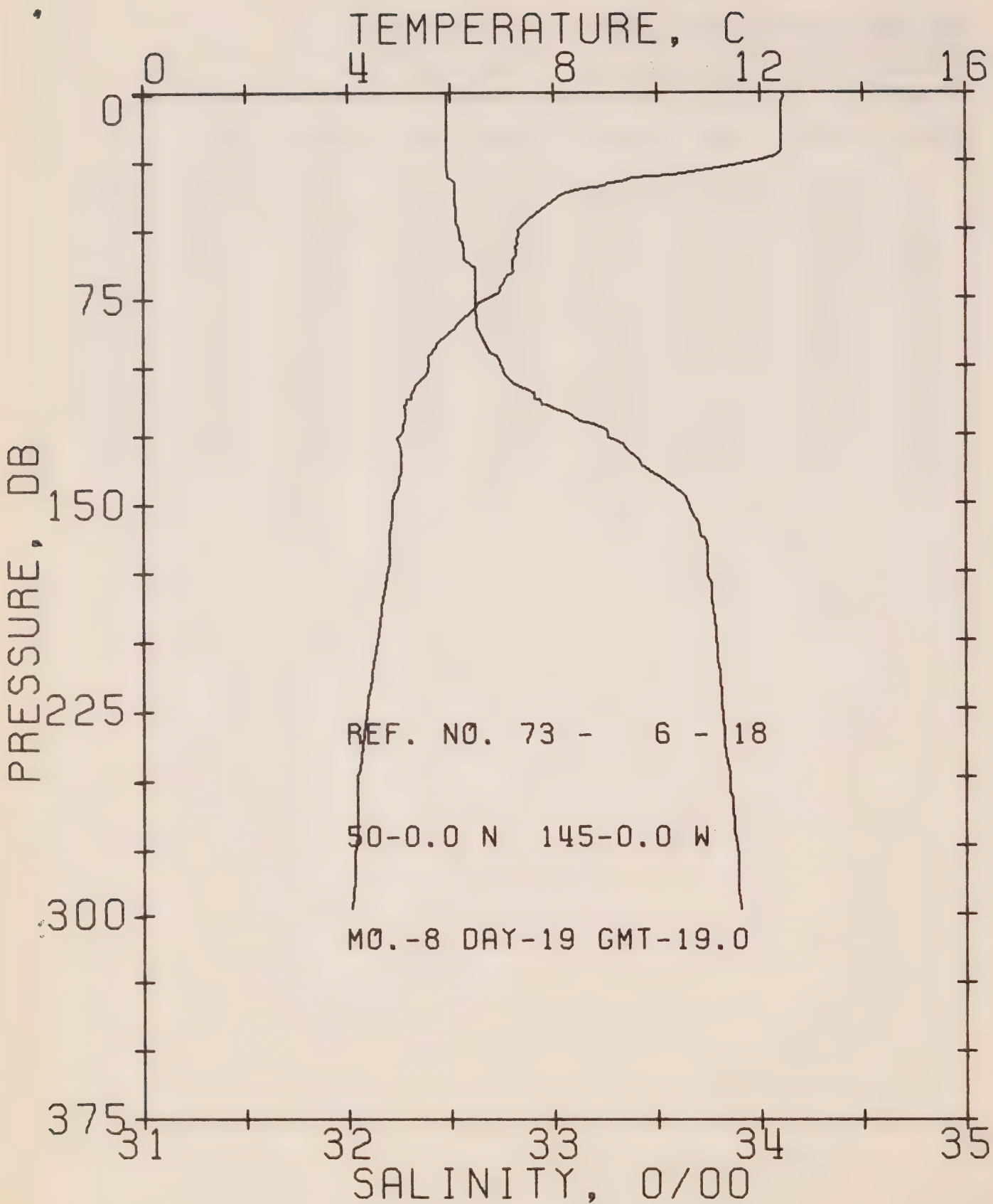
REFERENCE NO. 73- 6- 17

DATE 17/ 8/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.2

RESULTS OF STP CAST 108 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.40	32.49	0	24.59	335.7	0.0	0.0	1496.
10	12.40	32.49	10	24.59	336.2	0.34	0.02	1496.
20	12.40	32.49	20	24.59	336.4	0.67	0.07	1496.
30	12.12	32.49	30	24.64	331.6	1.01	0.15	1495.
50	7.38	32.57	50	25.48	252.0	1.56	0.38	1478.
75	6.40	32.61	75	25.64	236.9	2.18	0.77	1475.
100	5.21	32.91	99	26.03	200.4	2.73	1.26	1471.
125	5.03	33.46	124	26.48	157.8	3.18	1.77	1471.
150	4.84	33.71	149	26.70	137.3	3.54	2.28	1471.
175	4.69	33.77	174	26.76	131.0	3.88	2.83	1471.
200	4.47	33.30	199	26.81	126.6	4.20	3.44	1470.
225	4.29	33.82	223	26.84	123.9	4.51	4.12	1470.
250	4.15	33.85	248	26.88	120.3	4.82	4.86	1470.



OFFSHORE OCEANOGRAPHY GROUP

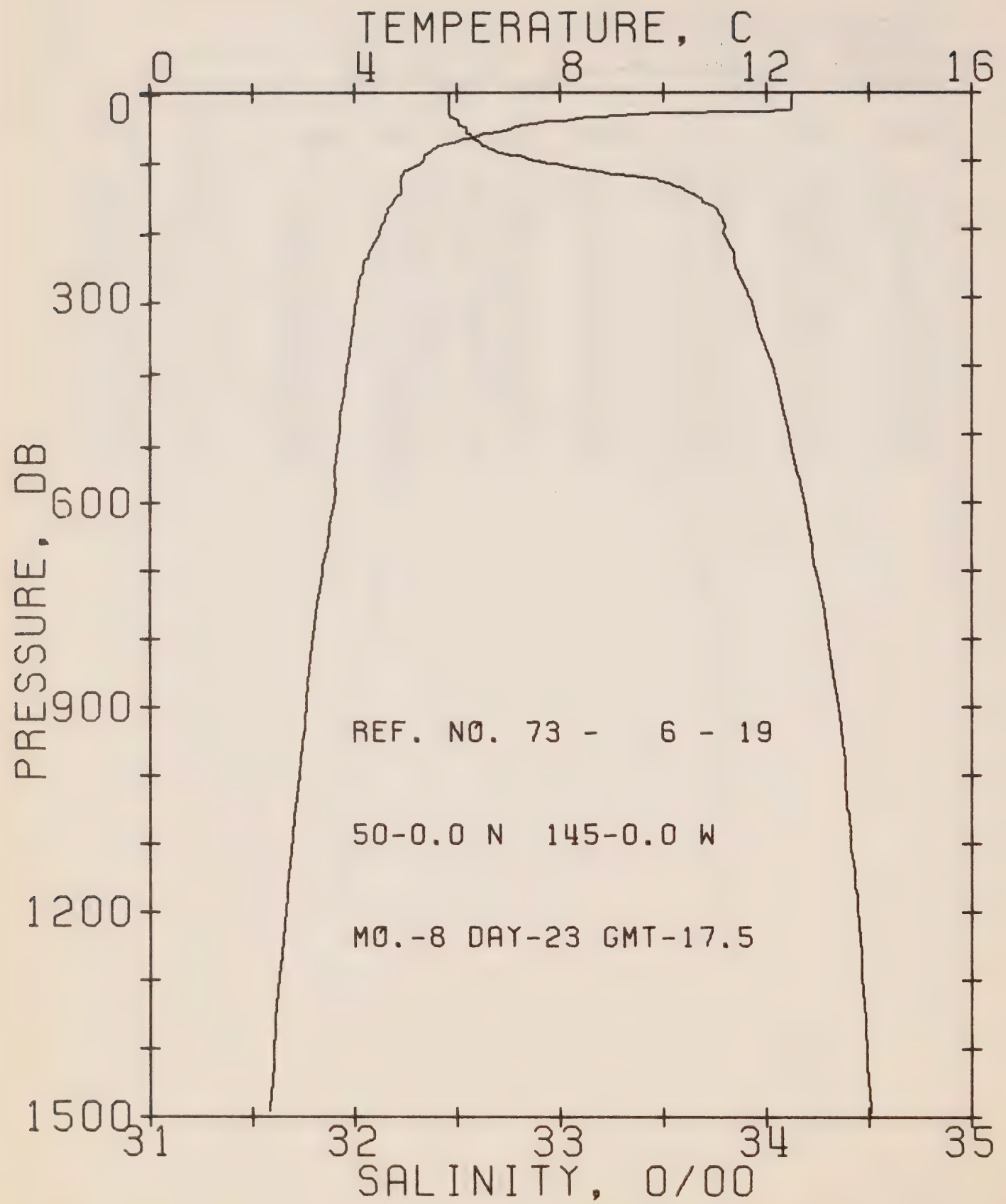
REFERENCE NO. 73- 6- 18

DATE 19/ 8/73

POSITION 50- 0.0N, 145- 0.0W GMT 19.0

RESULTS OF STP CAST 118 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.43	32.48	0	24.58	337.0	0.0	0.0	1436.
10	12.41	32.48	10	24.58	337.1	0.34	0.02	1496.
20	12.39	32.48	20	24.58	337.0	0.67	0.07	1496.
30	10.28	32.49	30	24.97	300.2	1.00	0.15	1489.
50	7.31	32.54	50	25.47	253.3	1.53	0.37	1478.
75	6.73	32.62	75	25.61	240.3	2.15	0.76	1476.
100	5.56	32.74	99	25.85	217.1	2.72	1.27	1472.
125	5.01	33.26	124	26.32	172.6	3.22	1.83	1471.
150	4.86	33.65	149	26.64	142.3	3.61	2.38	1471.
175	4.75	33.74	174	26.73	134.4	3.95	2.95	1471.
200	4.57	33.78	199	26.78	129.3	4.28	3.58	1471.
225	4.36	33.81	223	26.83	125.2	4.60	4.26	1470.
250	4.17	33.85	248	26.88	120.5	4.91	5.01	1470.



OFFSHORE OCEANOGRAPHY GROUP

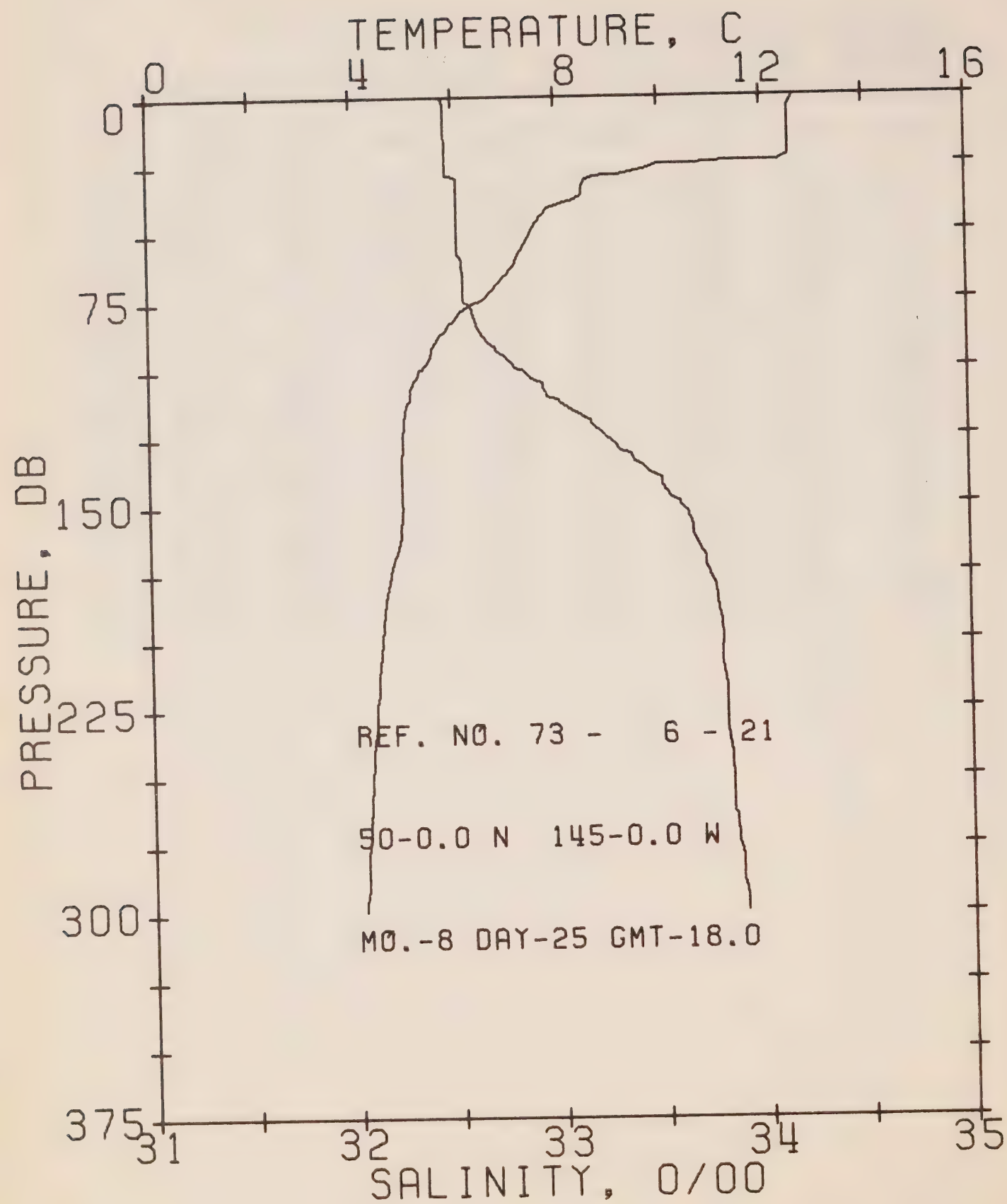
REFERENCE NO. 73- 6- 19

DATE 23/ 8/73

POSITION 50- 0.0N, 145- 0.0W GMT 17.5

RESULTS OF STP CAST 156 POINTS TAKEN FROM ANALOGG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	PCT. EN	SOUND
0	12.50	32.46	0	24.55	339.7	0.0	0.0	1496.
10	12.47	32.46	10	24.55	339.6	0.34	0.02	1496.
20	12.47	32.46	20	24.55	339.9	0.68	0.07	1496.
30	10.54	32.46	30	24.90	306.7	1.01	0.15	1490.
50	7.20	32.52	50	25.47	293.0	1.56	0.37	1477.
75	5.85	32.62	75	25.72	229.7	2.16	0.76	1473.
100	5.34	32.89	99	25.99	203.7	2.71	1.24	1471.
125	4.92	33.41	124	26.45	160.4	3.17	1.77	1471.
150	4.90	33.65	149	26.64	142.4	3.54	2.29	1471.
175	4.64	33.76	174	26.76	131.2	3.88	2.85	1471.
200	4.51	33.80	199	26.80	127.7	4.20	3.47	1471.
225	4.35	33.32	223	26.84	124.2	4.52	4.15	1470.
250	4.19	33.84	248	26.87	121.2	4.83	4.90	1470.
300	4.04	33.91	298	26.94	114.8	5.42	6.55	1470.
400	3.85	34.03	397	27.05	105.2	6.52	10.47	1471.
500	3.70	34.11	496	27.13	98.6	7.54	15.13	1473.
600	3.58	34.18	595	27.20	92.3	8.49	20.48	1474.
800	3.17	34.30	793	27.33	80.7	10.22	32.78	1475.
1000	2.90	34.38	990	27.42	73.0	11.75	46.77	1478.
1200	2.54	34.44	1198	27.50	66.8	13.14	62.39	1480.



OFFSHORE OCEANOGRAPHY GROUP

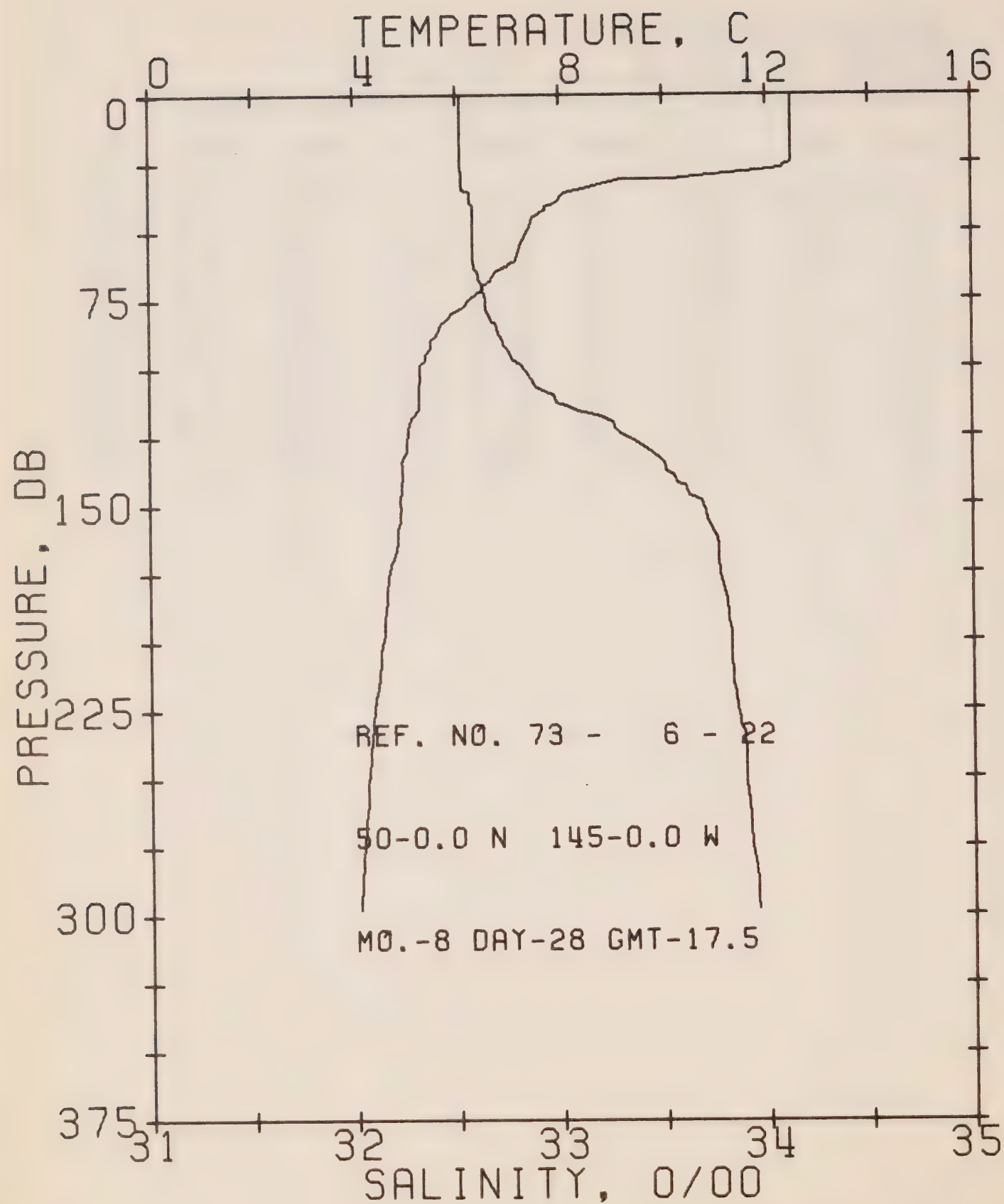
REFERENCE NO. 73- 6- 21

DATE 25/ 8/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.0

RESULTS OF STP CAST 114 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.65	32.45	0	24.51	343.2	0.0	0.0	1497.
10	12.53	32.46	10	24.54	340.6	0.34	0.02	1496.
20	12.52	32.47	20	24.55	340.2	0.68	0.07	1496.
30	8.63	32.52	30	25.26	272.7	0.99	0.15	1483.
50	7.49	32.52	50	25.43	257.1	1.52	0.36	1479.
75	6.53	32.55	75	25.58	242.9	2.15	0.76	1475.
100	5.36	32.81	99	25.93	210.0	2.71	1.26	1471.
125	4.96	33.24	124	26.31	173.8	3.19	1.81	1471.
150	4.95	33.59	149	26.59	147.4	3.59	2.37	1471.
175	4.69	33.72	174	26.72	134.8	3.94	2.95	1471.
200	4.52	33.79	199	26.79	128.3	4.27	3.57	1471.
225	4.38	33.80	223	26.82	126.3	4.59	4.26	1470.
250	4.27	33.83	243	26.85	123.1	4.90	5.02	1470.



OFFSHORE OCEANOGRAPHY GROUP

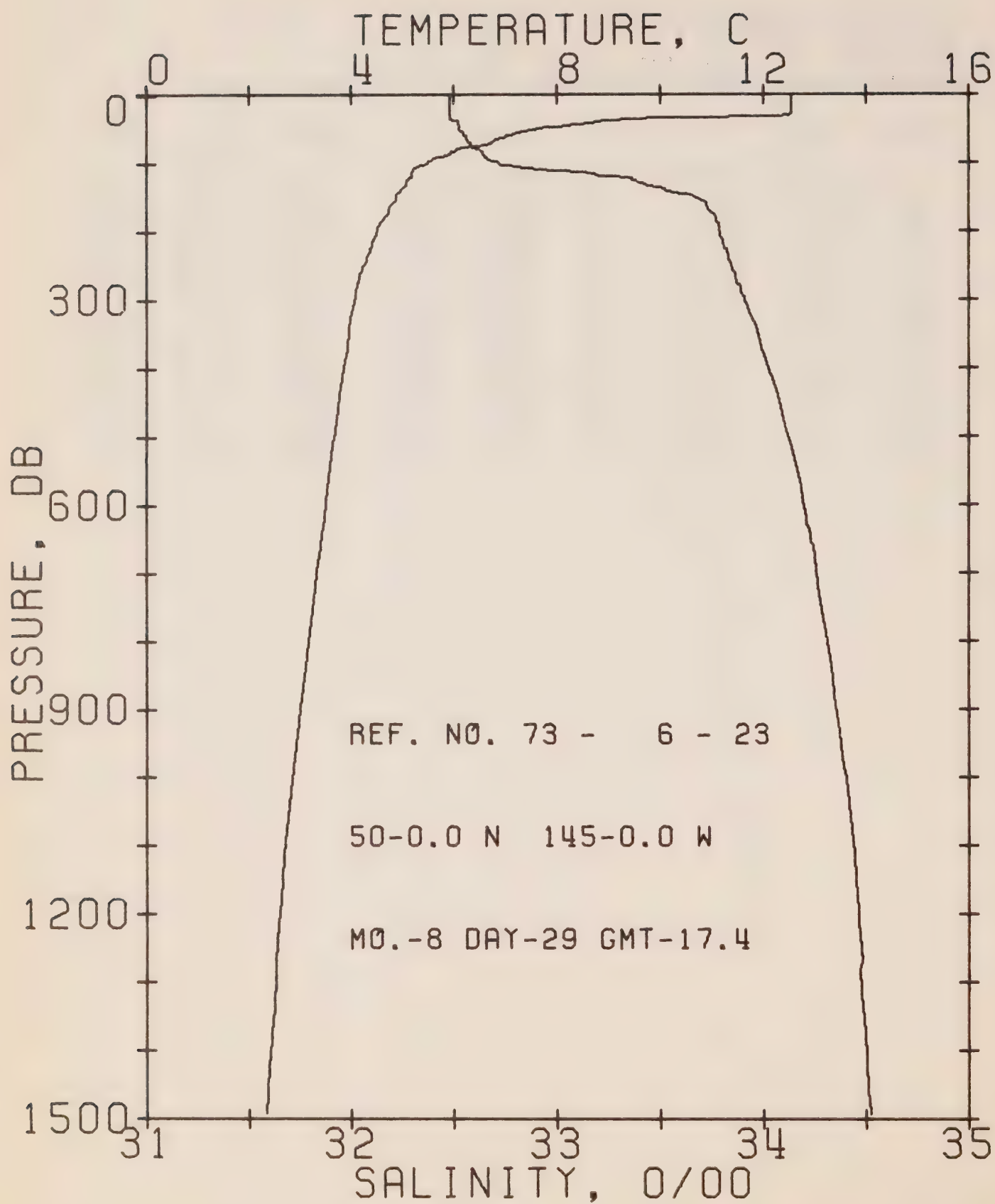
REFERENCE NO. 73- 6- 22

DATE 28/ 8/73

POSITION 50- 0.0N, 145- 0.0W GMT 17.5

RESULTS OF STP CAST 109 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.47	32.52	0	24.60	334.8	0.0	0.0	1496.
10	12.47	32.52	10	24.60	335.3	0.34	0.02	1496.
20	12.48	32.52	20	24.60	335.6	0.67	0.07	1496.
30	10.63	32.53	30	24.94	303.0	1.00	0.15	1490.
50	7.36	32.58	50	25.49	251.0	1.52	0.36	1478.
75	6.25	32.64	75	25.68	232.8	2.13	0.75	1474.
100	5.28	32.82	99	25.94	208.4	2.69	1.24	1471.
125	5.02	33.31	124	26.36	168.6	3.16	1.79	1471.
150	4.89	33.68	149	26.67	139.7	3.55	2.32	1471.
175	4.65	33.77	174	26.76	131.0	3.88	2.88	1471.
200	4.52	33.82	199	26.82	126.1	4.20	3.49	1471.
225	4.35	33.85	223	26.86	122.2	4.52	4.17	1470.
250	4.23	33.39	248	26.90	118.2	4.82	4.89	1470.



OFFSHORE OCEANOGRAPHY GROUP

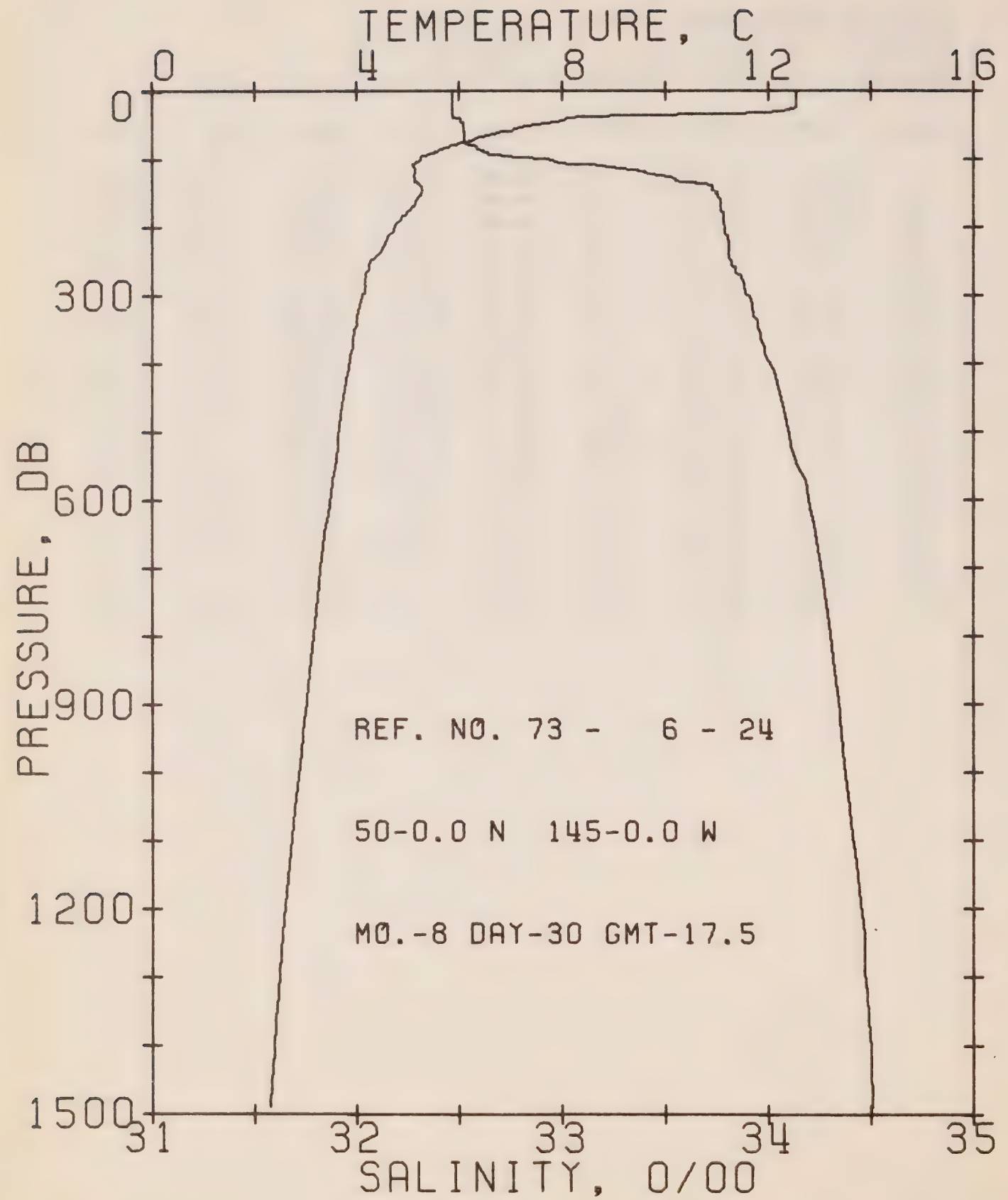
REFERENCE NO. 73- 6- 23

DATE 29/ 8/73

POSITION 50- 0.0N, 145- 0.0W GMT 17.4

RESULTS OF STP CAST 160 FCINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.52	32.48	0	24.56	338.7	0.0	0.0	1496.
10	12.52	32.48	10	24.56	339.1	0.34	0.02	1496.
20	12.52	32.48	20	24.56	339.3	0.68	0.07	1496.
30	12.45	32.48	30	24.57	338.3	1.02	0.16	1496.
50	7.72	32.53	50	25.40	259.5	1.59	0.39	1479.
75	6.45	32.59	75	25.62	238.9	2.21	0.78	1475.
100	5.48	32.71	99	25.83	218.6	2.78	1.29	1472.
125	5.10	33.36	124	26.39	166.1	3.27	1.84	1471.
150	4.88	33.66	149	26.65	141.5	3.65	2.38	1471.
175	4.69	33.75	174	26.74	133.0	3.99	2.95	1471.
200	4.51	33.78	199	26.79	128.8	4.32	3.57	1471.
225	4.37	33.81	223	26.83	125.4	4.64	4.26	1470.
250	4.26	33.84	248	26.86	122.2	4.95	5.00	1470.
300	4.06	33.91	298	26.94	115.3	5.54	6.66	1471.
400	3.86	34.02	397	27.05	105.5	6.64	10.59	1471.
500	3.66	34.12	496	27.14	97.2	7.65	15.22	1472.
600	3.49	34.19	595	27.22	90.6	8.59	20.46	1473.
800	3.16	34.31	793	27.34	79.8	10.29	32.55	1475.
1000	2.84	34.40	990	27.44	71.0	11.80	46.35	1477.
1200	2.58	34.46	1188	27.52	64.8	13.15	61.48	1480.



OFFSHORE OCEANOGRAPHY GROUP

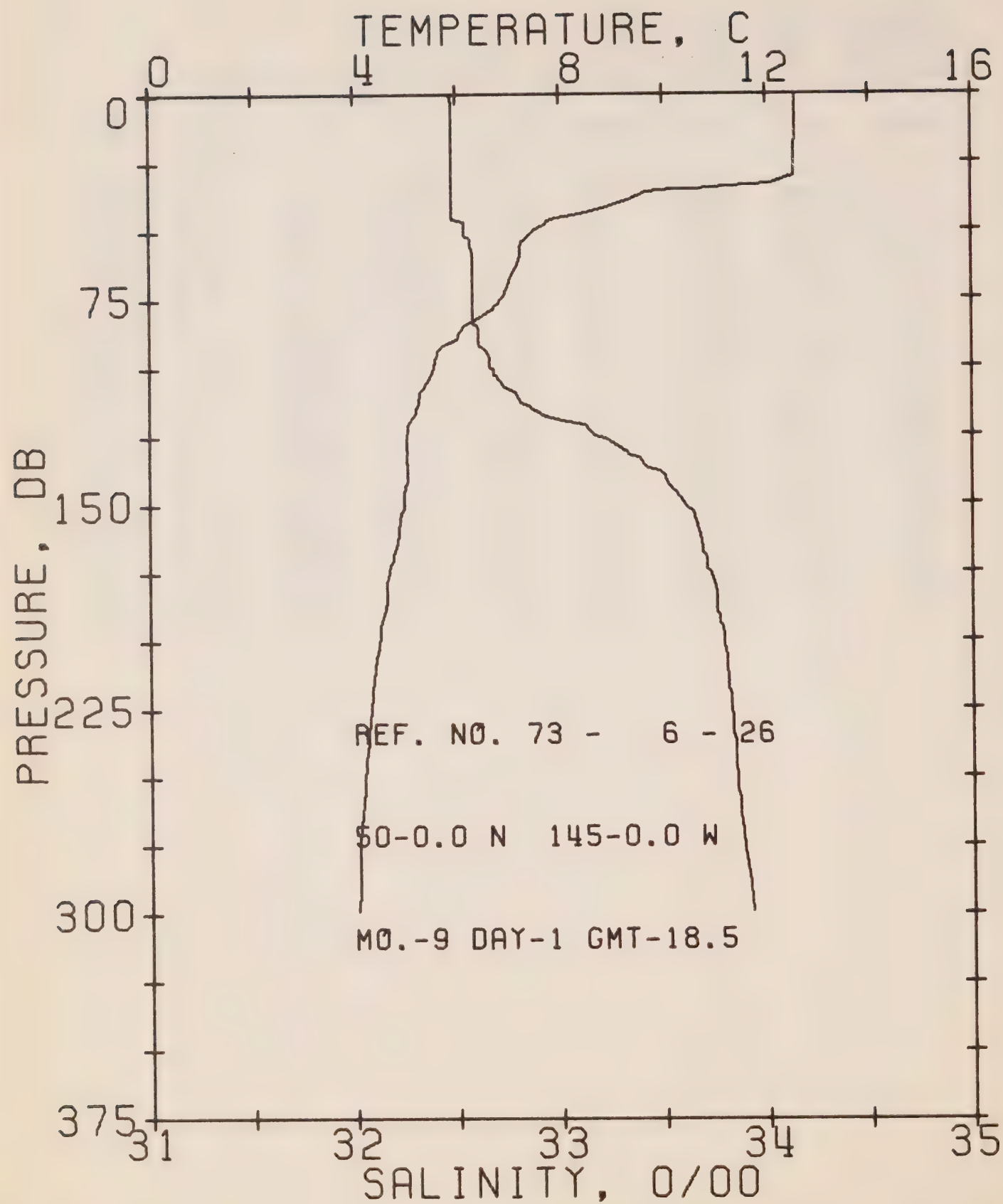
REFERENCE NO. 73- 6- 24

DATE 30/ 8/73

POSITION 50- 0.0N, 145- 0.0W GMT 17.5

RESULTS OF STP CAST 185 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.54	32.47	0	24.55	339.7	0.0	0.0	1496.
10	12.54	32.47	10	24.55	340.1	0.34	0.02	1496.
20	12.53	32.47	20	24.55	340.2	0.68	0.07	1496.
30	12.24	32.47	30	24.61	335.2	1.02	0.16	1496.
50	7.59	32.52	50	25.41	258.5	1.59	0.38	1479.
75	6.13	32.53	75	25.61	239.5	2.21	0.78	1474.
100	5.25	32.87	99	25.99	204.2	2.77	1.28	1471.
125	5.13	33.50	124	26.49	156.2	3.22	1.79	1472.
150	5.27	33.74	149	26.67	139.6	3.58	2.30	1473.
175	5.04	33.77	174	26.72	135.3	3.93	2.87	1472.
200	4.74	33.79	199	26.77	130.6	4.26	3.50	1472.
225	4.55	33.81	223	26.81	127.4	4.58	4.20	1471.
250	4.29	33.82	249	26.84	124.2	4.90	4.96	1471.
300	4.11	33.90	298	26.92	116.8	5.50	6.65	1471.
400	3.85	34.00	397	27.03	106.9	6.61	10.62	1471.
500	3.65	34.10	496	27.13	98.8	7.64	15.30	1472.
600	3.47	34.20	595	27.23	90.1	8.58	20.60	1473.
800	3.15	34.30	793	27.34	80.3	10.28	32.66	1475.
1000	2.86	34.37	990	27.42	73.0	11.81	46.66	1478.
1200	2.59	34.45	1188	27.51	65.5	13.19	62.14	1480.



OFFSHORE OCEANOGRAPHY GROUP

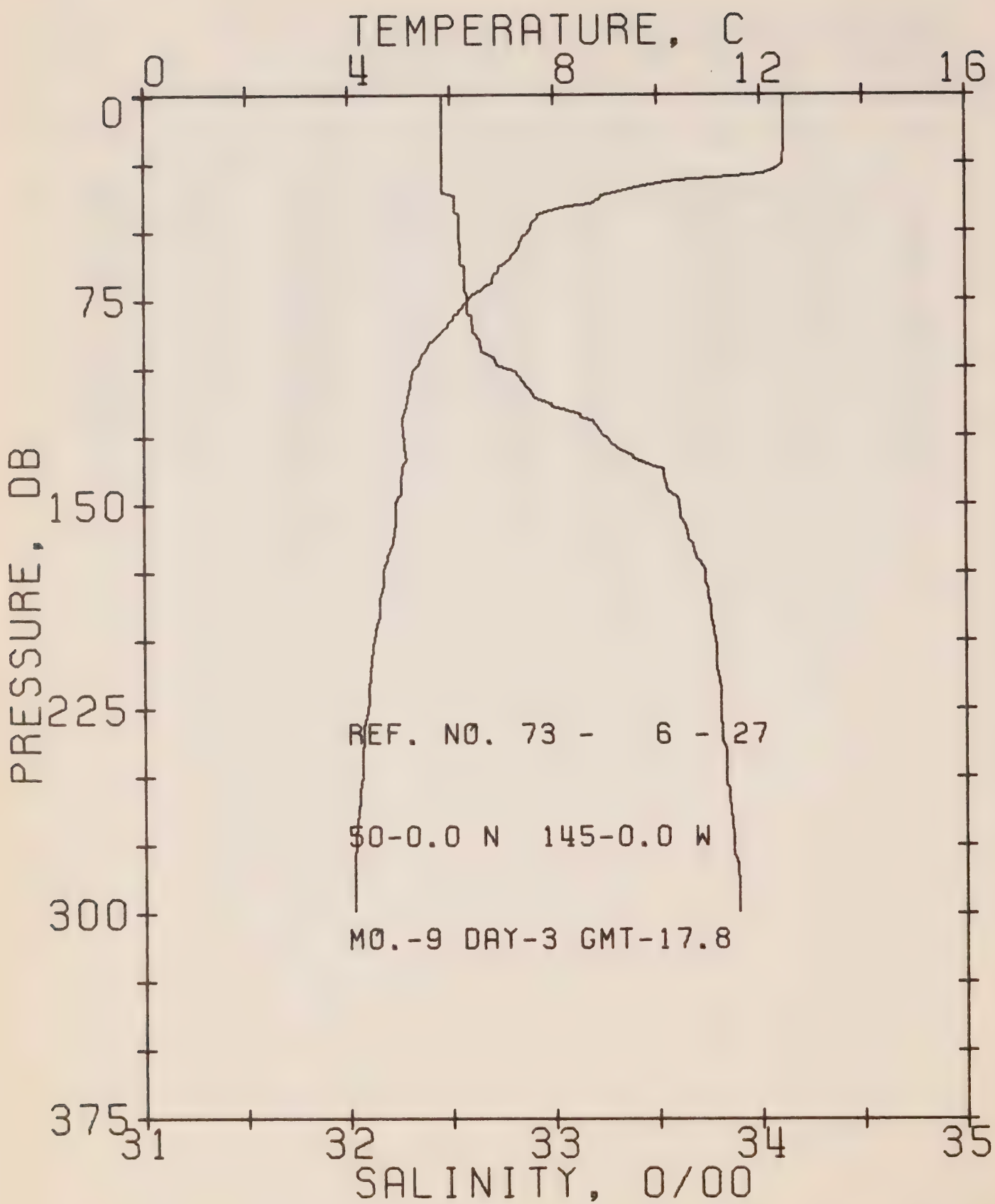
REFERENCE NO. 73- 6- 26

DATE 1/ 9/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.5

RESULTS OF STP CAST 110 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	PCT. EN	SOUND
0	12.55	32.47	0	24.55	339.9	0.0	0.0	1496.
10	12.55	32.48	10	24.55	339.6	0.34	0.02	1496.
20	12.54	32.48	20	24.56	339.8	0.68	0.07	1496.
30	12.54	32.48	30	24.56	339.9	1.02	0.16	1497.
50	7.49	32.54	50	25.44	255.7	1.60	0.39	1479.
75	6.86	32.58	75	25.56	244.9	2.22	0.78	1477.
100	5.55	32.66	99	25.78	223.3	2.80	1.30	1472.
125	5.01	33.17	124	26.25	179.4	3.31	1.89	1471.
150	4.95	33.60	149	26.60	146.7	3.71	2.45	1471.
175	4.66	33.72	174	26.72	134.8	4.06	3.03	1471.
200	4.46	33.79	199	26.80	127.6	4.39	3.65	1470.
225	4.29	33.82	223	26.85	123.6	4.71	4.33	1470.
250	4.18	33.85	243	26.88	120.8	5.01	5.07	1470.



OFFSHORE OCEANOGRAPHY GROUP

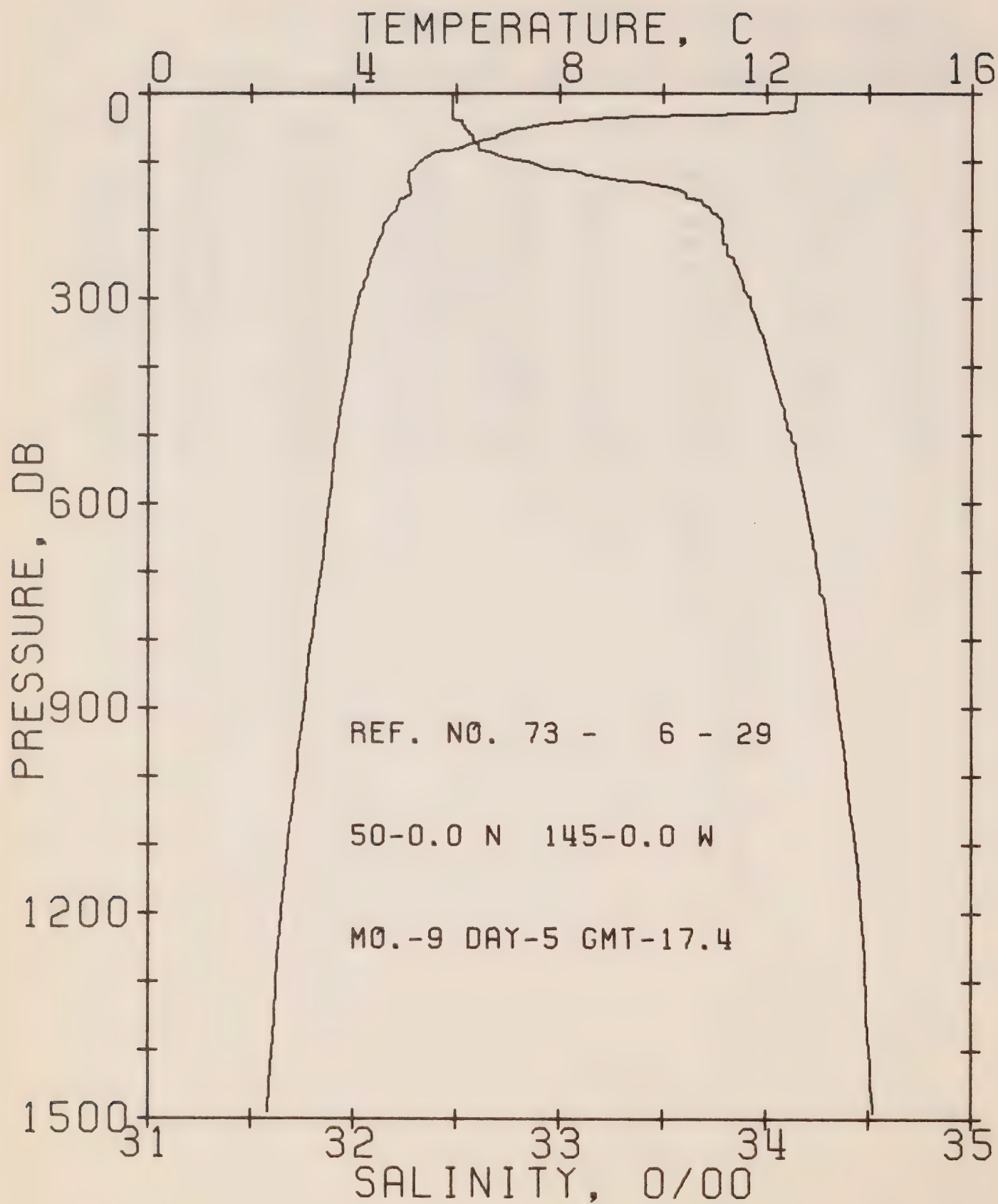
REFERENCE NO. 73- 6- 27

DATE 3/ 9/73

POSITION 50- 0.0N, 145- 0.0W GMT 17.8

RESULTS OF STP CAST 124 POINTS TAKEN FROM ANALOG TRACE...

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.46	32.46	0	24.56	339.0	0.0	0.0	1496.
10	12.45	32.46	10	24.56	339.4	0.34	0.02	1496.
20	12.44	32.46	20	24.56	339.3	0.68	0.07	1496.
30	11.46	32.46	30	24.74	322.2	1.02	0.15	1493.
50	7.51	32.54	50	25.44	256.0	1.57	0.38	1479.
75	6.32	32.58	75	25.63	238.1	2.19	0.77	1474.
100	5.31	32.76	99	25.89	213.1	2.76	1.28	1471.
125	5.08	33.24	124	26.30	174.5	3.24	1.83	1471.
150	4.92	33.60	149	26.60	146.3	3.63	2.38	1471.
175	4.66	33.73	174	26.73	134.0	3.99	2.97	1471.
200	4.47	33.78	199	26.79	128.9	4.32	3.60	1470.
225	4.34	33.80	223	26.82	125.9	4.64	4.29	1470.
250	4.22	33.83	248	26.86	122.6	4.95	5.04	1470.



OFFSHORE OCEANOGRAPHY GROUP

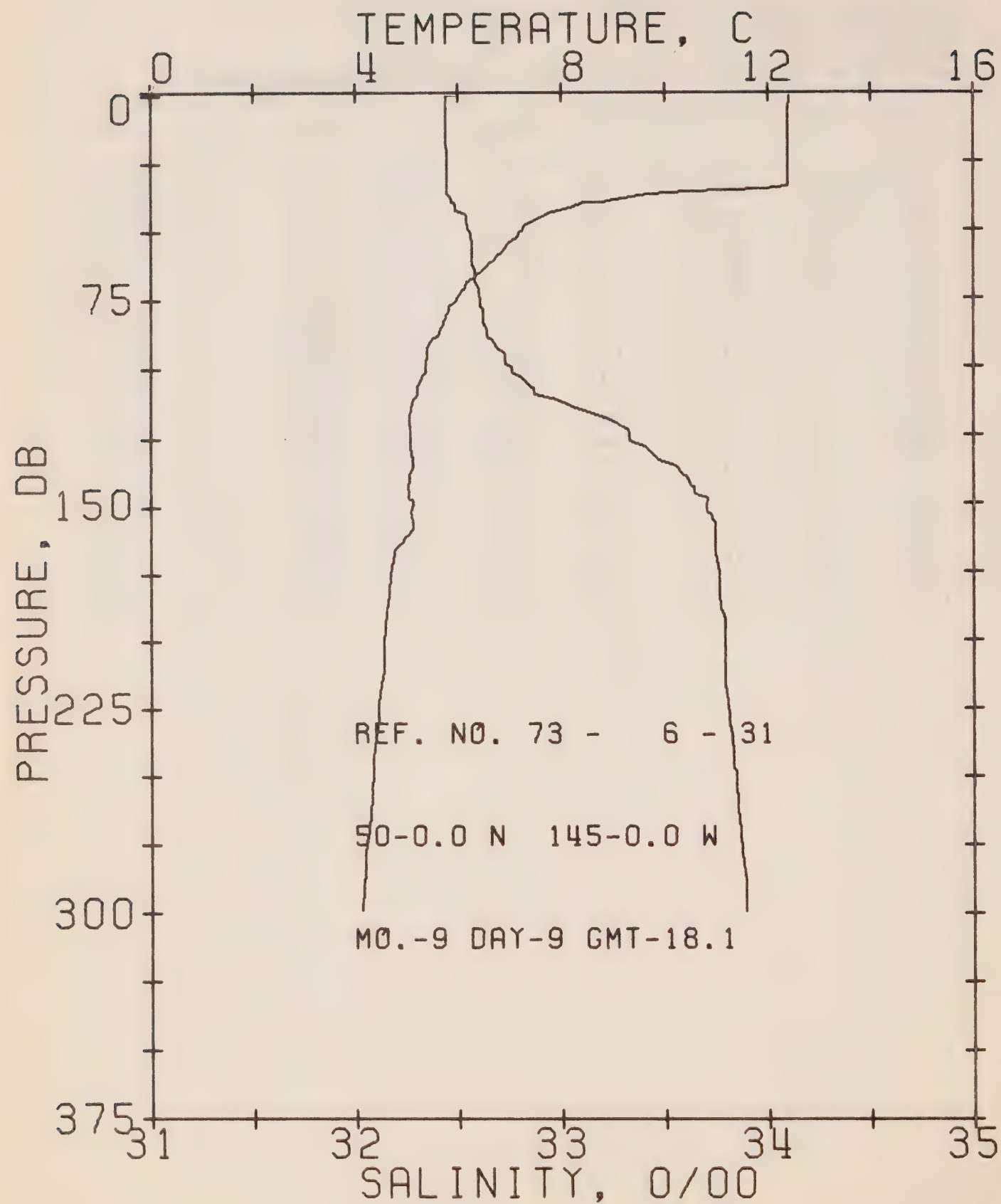
REFERENCE NO. 73- 6- 29

DATE 5/ 9/73

POSITION 50- 0.0N, 145- 0.0W GMT 17.4

RESULTS OF STP CAST 156 PCINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.55	32.48	0	24.55	339.2	0.0	0.0	1496.
10	12.54	32.48	10	24.56	339.5	0.34	0.02	1496.
20	12.53	32.48	20	24.56	339.6	0.68	0.07	1496.
30	12.05	32.48	30	24.65	331.1	1.02	0.16	1495.
50	7.44	32.54	50	25.45	255.0	1.57	0.38	1478.
75	6.27	32.60	75	25.65	236.0	2.19	0.77	1474.
100	5.30	32.82	99	25.94	208.5	2.75	1.27	1471.
125	5.07	33.25	124	26.31	174.0	3.23	1.82	1471.
150	5.05	33.61	149	26.59	147.0	3.62	2.37	1472.
175	4.76	33.74	174	26.73	134.4	3.97	2.95	1471.
200	4.55	33.78	199	26.79	129.1	4.30	3.57	1471.
225	4.43	33.81	223	26.82	126.1	4.62	4.26	1471.
250	4.29	33.84	248	26.86	122.6	4.93	5.02	1471.
300	4.09	33.92	298	26.94	114.9	5.53	6.68	1471.
400	3.88	34.02	397	27.04	106.1	6.63	10.61	1472.
500	3.67	34.12	496	27.14	97.2	7.65	15.27	1472.
600	3.53	34.19	595	27.22	91.1	8.59	20.54	1474.
800	3.18	34.30	793	27.34	80.4	10.30	32.72	1476.
1000	2.88	34.39	990	27.43	72.0	11.82	46.62	1478.
1200	2.58	34.46	1183	27.52	64.8	13.18	61.85	1480.



OFFSHORE OCEANOGRAPHY GROUP

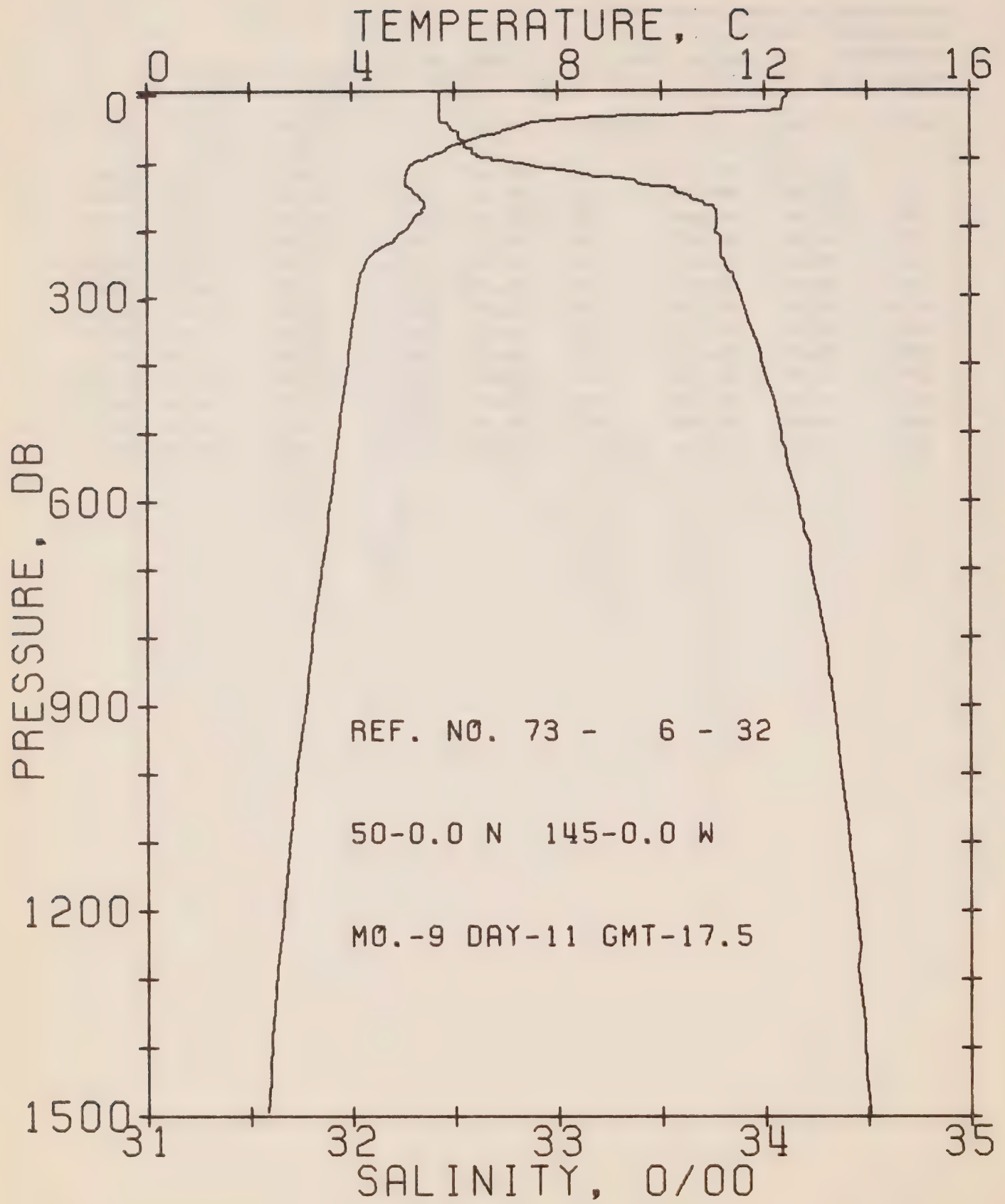
REFERENCE NO. 73- 6- 31

DATE 9/ 9/73

POSITION 50- 0.0N, 145- 0.0W GMT 18.1

RESULTS OF STP CAST 113 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.39	32.44	0	24.55	339.2	0.0	0.0	1496.
10	12.36	32.44	10	24.56	339.0	0.34	0.02	1496.
20	12.36	32.44	20	24.56	339.0	0.68	0.07	1496.
30	12.36	32.45	30	24.57	338.9	1.02	0.16	1496.
50	7.24	32.55	50	25.48	251.6	1.59	0.39	1478.
75	5.97	32.60	75	25.69	232.1	2.20	0.77	1473.
100	5.35	32.76	99	25.89	213.6	2.76	1.27	1471.
125	5.06	33.33	124	26.37	167.9	3.24	1.82	1471.
150	5.12	33.70	149	26.66	141.1	3.62	2.35	1472.
175	4.68	33.76	174	26.75	132.2	3.96	2.92	1471.
200	4.54	33.79	199	26.79	128.5	4.29	3.54	1471.
225	4.44	33.80	223	26.81	126.7	4.61	4.23	1471.
250	4.30	33.84	248	26.86	122.7	4.92	4.99	1471.



OFFSHORE OCEANOGRAPHY GROUP

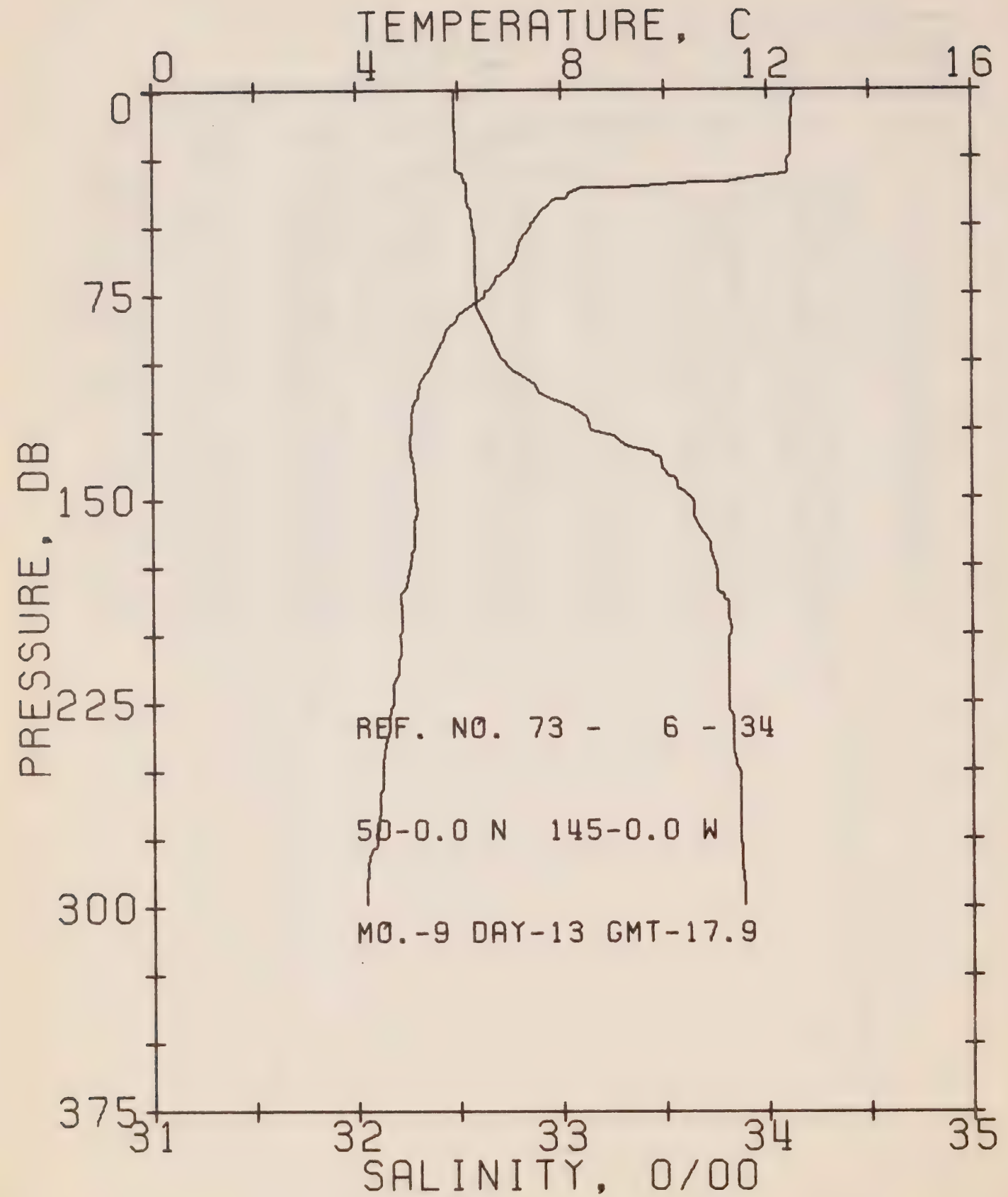
REFERENCE NO. 73- 6- 32

DATE 11/ 9/73

POSITION 50- 0.0N, 145- 0.0W GMT 17.5

RESULTS OF STP CAST 168 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	PCT. EN	SOUND
0	12.50	32.43	0	24.52	341.9	0.0	0.0	1496.
10	12.43	32.43	10	24.54	341.1	0.34	0.02	1496.
20	12.34	32.43	20	24.56	339.7	0.68	0.07	1496.
30	11.91	32.43	30	24.64	332.3	1.02	0.16	1494.
50	7.36	32.47	50	25.40	259.1	1.59	0.39	1478.
75	6.22	32.55	75	25.61	239.4	2.22	0.78	1474.
100	5.46	32.68	99	25.81	220.8	2.79	1.30	1471.
125	5.05	33.17	124	26.25	179.7	3.29	1.87	1471.
150	5.21	33.58	149	26.55	151.2	3.69	2.43	1472.
175	5.38	33.77	174	26.68	139.1	4.06	3.03	1474.
200	5.10	33.77	199	26.71	136.2	4.40	3.68	1473.
225	4.67	33.79	223	26.78	130.1	4.73	4.41	1472.
250	4.27	33.80	243	26.83	125.1	5.05	5.18	1470.
300	4.07	33.88	298	26.91	117.5	5.66	6.87	1471.
400	3.91	33.98	397	27.01	109.1	6.79	10.89	1472.
500	3.73	34.08	496	27.11	100.9	7.83	15.68	1473.
600	3.56	34.16	595	27.19	93.6	8.81	21.15	1474.
800	3.21	34.29	793	27.32	81.8	10.57	33.63	1476.
1000	2.90	34.37	990	27.41	74.0	12.12	47.90	1478.
1200	2.63	34.44	1188	27.50	66.8	13.53	63.60	1480.



OFFSHORE OCEANOGRAPHY GROUP

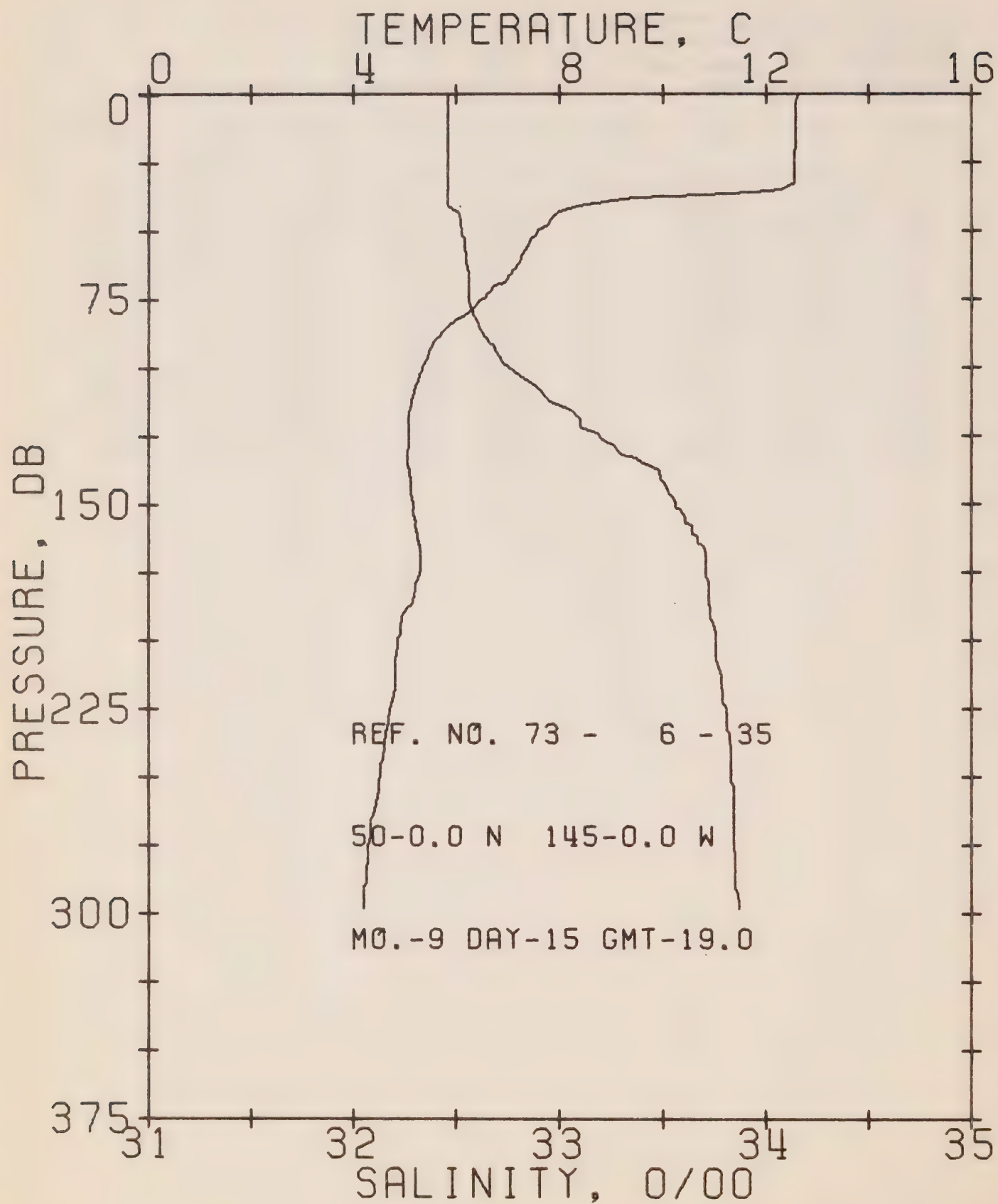
REFERENCE NO. 73- 6- 34

DATE 13/ 9/73

POSITION 50- 0.0N, 145- 0.0W GMT 17.9

RESULTS OF STP CAST 131 PCINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.54	32.48	0	24.56	339.0	0.0	0.0	1496.
10	12.45	32.48	10	24.57	337.9	0.34	0.02	1496.
20	12.45	32.49	20	24.58	337.3	0.68	0.07	1496.
30	12.39	32.49	30	24.59	336.5	1.01	0.15	1496.
50	7.41	32.57	50	25.48	252.3	1.56	0.38	1478.
75	6.51	32.59	75	25.61	239.7	2.18	0.77	1475.
100	5.43	32.72	99	25.84	217.9	2.75	1.28	1472.
125	5.06	33.14	124	26.22	182.1	3.25	1.84	1471.
150	5.15	33.63	149	26.60	146.7	3.64	2.40	1472.
175	5.03	33.74	174	26.70	137.1	4.00	2.99	1472.
200	4.84	33.82	199	26.78	129.5	4.33	3.62	1472.
225	4.68	33.81	223	26.79	128.8	4.66	4.32	1472.
250	4.48	33.85	248	26.85	123.6	4.97	5.09	1471.



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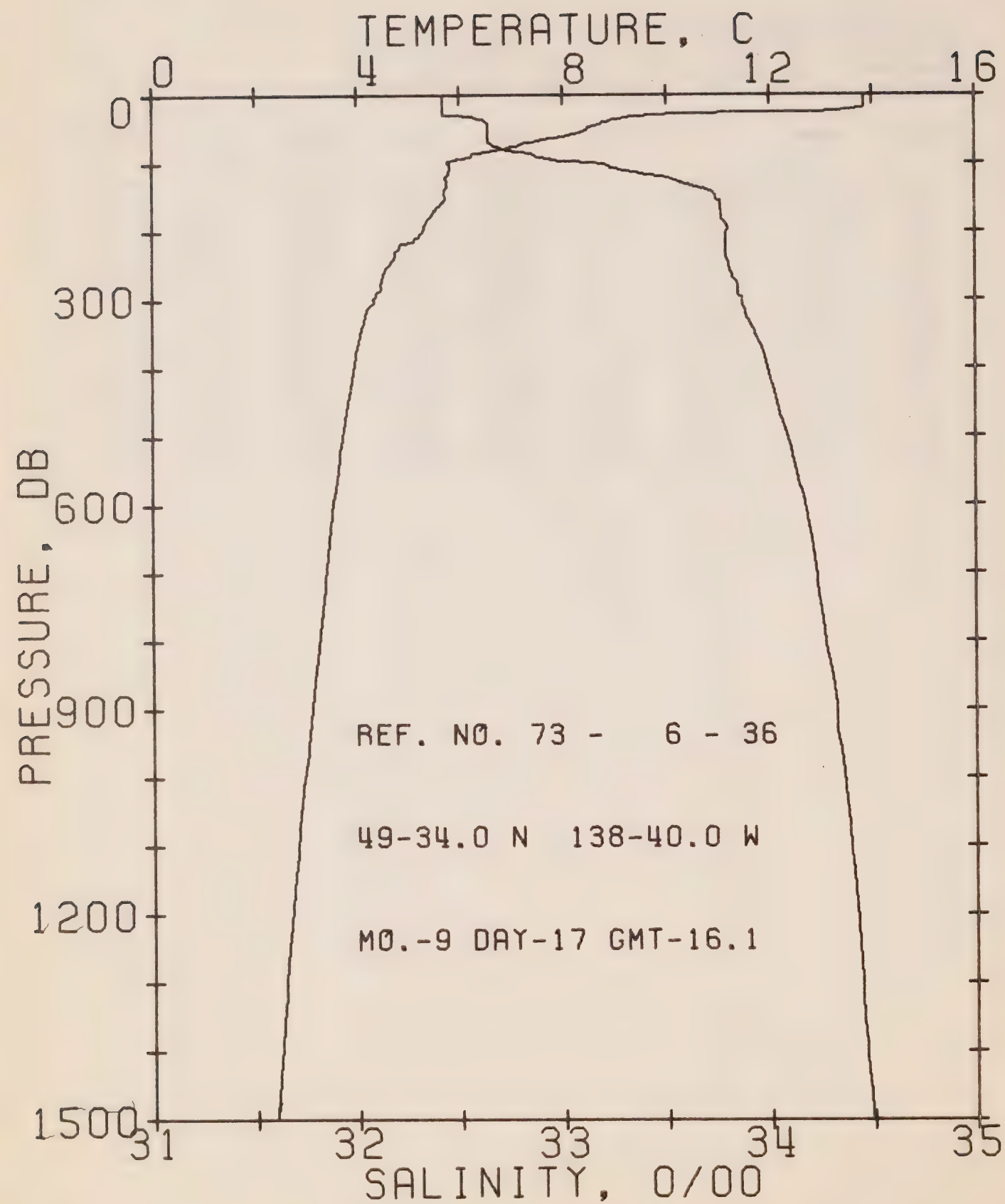
REFERENCE NO. 73- 6- 35

DATE 15/ 9/73

POSITION 50- 0.0N, 145- 0.0W GMT 19.0

RESULTS OF STP CAST 126 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.60	32.46	0	24.53	341.6	0.0	0.0	1496.
10	12.55	32.46	10	24.54	341.1	0.34	0.02	1496.
20	12.54	32.46	20	24.54	341.2	0.68	0.07	1496.
30	12.54	32.46	30	24.54	341.4	1.02	0.16	1497.
50	7.57	32.53	50	25.42	257.5	1.61	0.39	1479.
75	6.54	32.56	75	25.58	242.3	2.24	0.79	1475.
100	5.36	32.76	99	25.88	213.9	2.80	1.30	1471.
125	5.06	33.19	124	26.26	178.4	3.29	1.85	1471.
150	5.17	33.56	149	26.54	152.1	3.70	2.42	1472.
175	5.29	33.71	174	26.65	142.5	4.06	3.02	1473.
200	4.86	33.75	199	26.73	135.0	4.41	3.69	1472.
225	4.69	33.31	223	26.79	128.9	4.74	4.41	1472.
250	4.50	33.93	248	26.83	125.6	5.06	5.17	1471.



OFFSHORE OCEANOGRAPHY GROUP

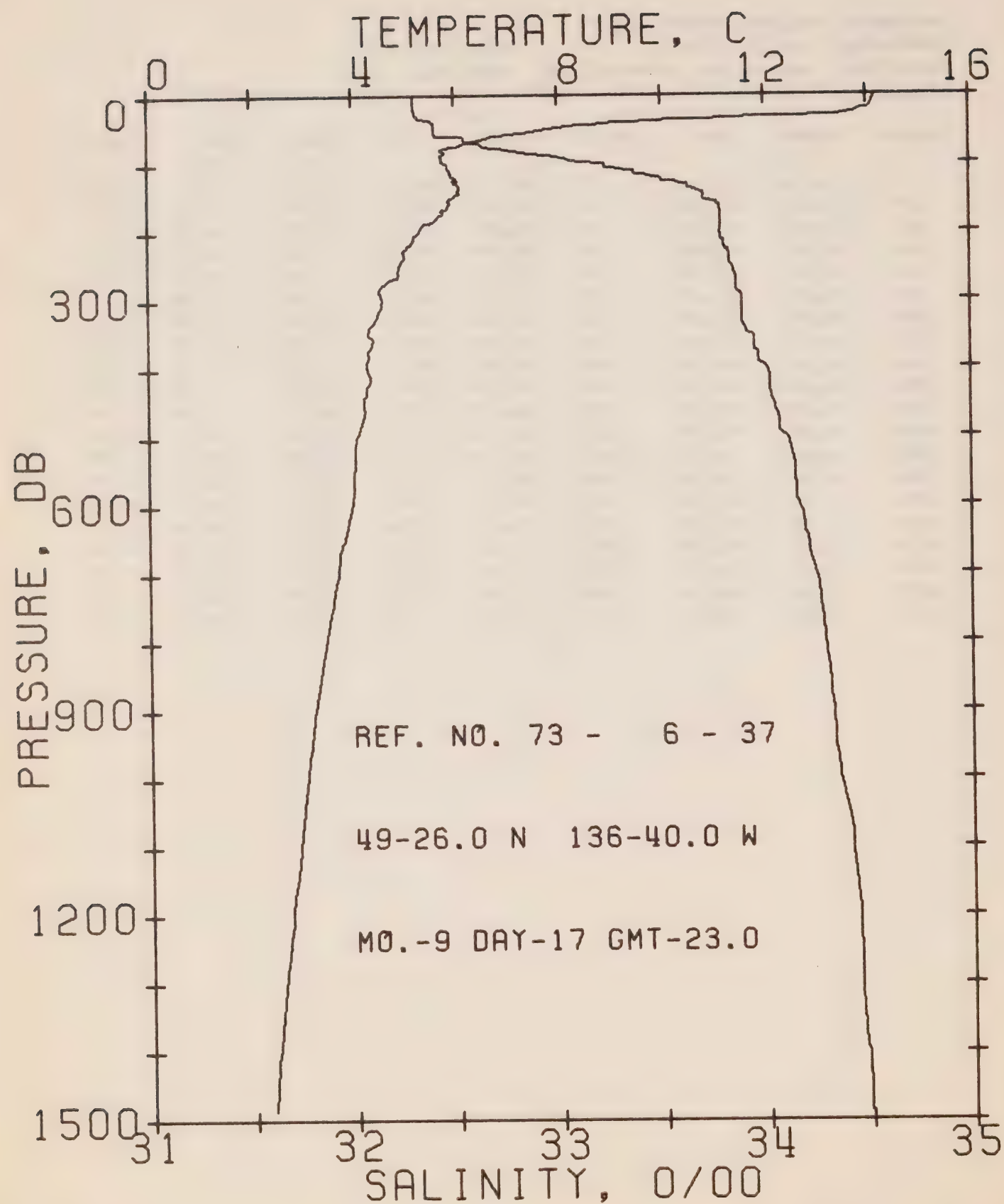
REFERENCE NO. 73- 6- 36

DATE 17/ 9/73

POSITION 49-34.0N, 138-40.0W GMT 16.1

RESULTS OF STP CAST 171 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. FN	SOUND
0	13.84	32.42	0	24.25	367.9	0.0	0.0	1500.
10	13.83	32.42	10	24.25	368.3	0.37	0.02	1501.
20	13.82	32.42	20	24.26	368.3	0.74	0.08	1501.
30	9.89	32.42	30	24.98	299.2	1.08	0.16	1487.
50	8.48	32.64	50	25.38	262.0	1.62	0.38	1483.
75	7.13	32.67	75	25.59	241.6	2.25	0.78	1478.
100	5.76	33.08	99	26.09	194.0	2.81	1.27	1473.
125	5.75	33.53	124	26.45	161.0	3.25	1.78	1474.
150	5.74	33.74	149	26.61	145.3	3.63	2.31	1475.
175	5.46	33.77	174	26.67	140.1	3.98	2.90	1474.
200	5.27	33.80	199	26.72	135.9	4.33	3.56	1474.
225	4.81	33.79	223	26.76	131.7	4.66	4.29	1472.
250	4.60	33.30	248	26.79	129.0	4.99	5.08	1472.
300	4.33	33.96	298	26.87	122.2	5.62	6.84	1472.
400	3.94	33.99	397	27.01	109.2	6.77	10.93	1472.
500	3.71	34.08	496	27.11	100.6	7.82	15.74	1473.
600	3.52	34.16	595	27.19	93.0	8.79	21.16	1474.
800	3.24	34.27	793	27.30	84.0	10.55	33.71	1476.
1000	2.95	34.35	990	27.40	75.5	12.14	48.25	1478.
1200	2.68	34.42	1188	27.47	69.1	13.58	64.40	1480.



OFFSHORE OCEANOGRAPHY GROUP

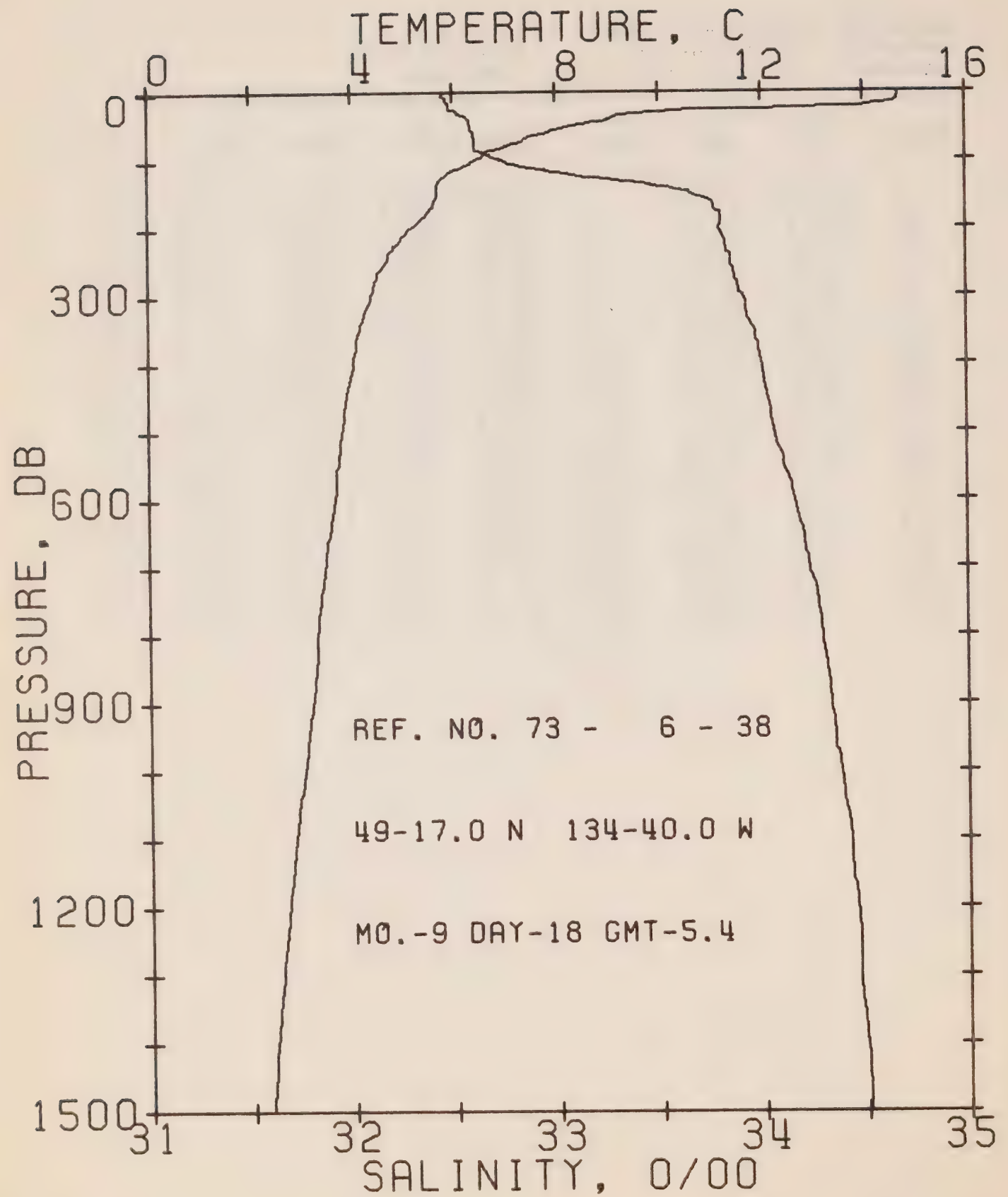
REFERENCE NO. 73- 6- 37

DATE 17/ 9/73

POSITION 49-26.0N, 136-40.0W GMT 23.0

RESULTS OF STP CAST 238 PCINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.15	32.30	0	24.10	382.8	0.0	0.0	1501.
10	14.10	32.30	10	24.11	382.3	0.38	0.02	1501.
20	14.03	32.30	20	24.12	381.2	0.76	0.08	1501.
30	13.36	32.32	30	24.27	366.9	1.14	0.17	1499.
50	7.82	32.40	50	25.28	270.5	1.75	0.42	1480.
75	6.05	32.64	75	25.71	230.4	2.37	0.81	1473.
100	5.81	33.19	99	26.17	186.6	2.89	1.27	1474.
125	5.99	33.50	124	26.39	165.9	3.33	1.78	1475.
150	5.97	33.70	149	26.55	151.1	3.72	2.32	1476.
175	5.75	33.79	174	26.65	142.0	4.08	2.92	1475.
200	5.30	33.79	199	26.70	137.2	4.43	3.59	1474.
225	5.04	33.81	223	26.75	132.8	4.77	4.32	1473.
250	4.92	33.84	248	26.79	129.4	5.10	5.11	1473.
300	4.59	33.89	298	26.87	122.6	5.72	6.87	1473.
400	4.28	34.00	397	26.99	111.5	6.90	11.07	1473.
500	4.06	34.10	496	27.09	103.0	7.99	16.04	1474.
600	3.75	34.16	595	27.15	97.9	8.99	21.65	1475.
800	3.43	34.28	793	27.30	84.7	10.80	34.50	1477.
1000	3.03	34.35	990	27.39	76.5	12.40	49.21	1478.
1200	2.72	34.44	1188	27.49	67.8	13.83	65.19	1480.



OFFSHORE OCEANOGRAPHY GROUP

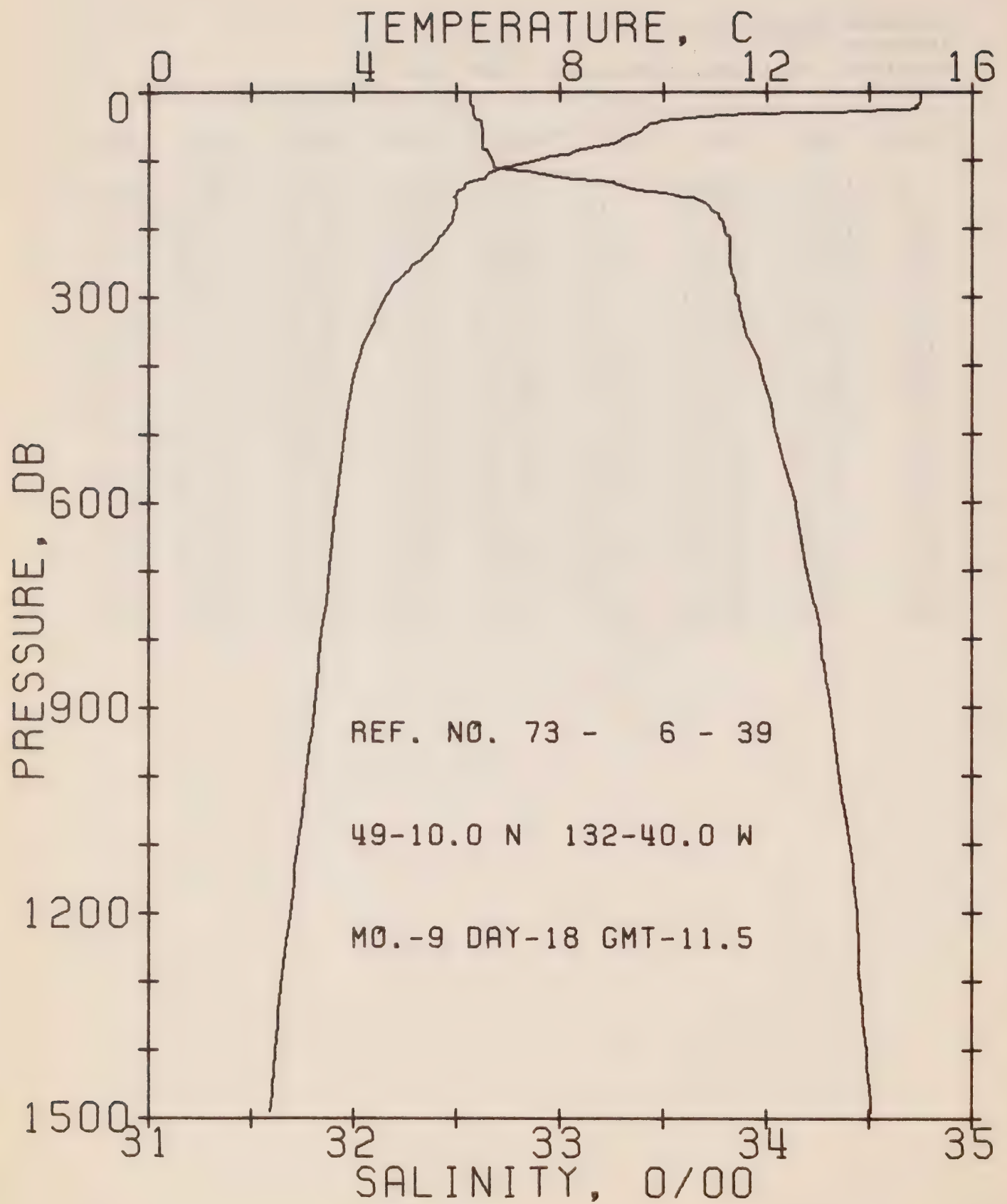
REFERENCE NO. 73- 6- 38

DATE 18/ 9/73

POSITION 49-17.0N, 134-40.0W GMT 5.4

RESULTS OF STP CAST 216 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.67	32.46	0	24.11	381.5	0.0	0.0	1503.
10	14.67	32.47	10	24.12	381.2	0.38	0.02	1503.
20	14.18	32.48	20	24.23	370.9	0.76	0.08	1502.
30	10.09	32.52	30	25.03	295.0	1.09	0.16	1488.
50	8.36	32.59	50	25.35	264.0	1.64	0.38	1482.
75	7.27	32.61	75	25.53	247.9	2.28	0.79	1478.
100	6.45	32.73	99	25.73	228.8	2.88	1.32	1476.
125	5.82	33.15	124	26.14	190.1	3.41	1.93	1474.
150	5.68	33.66	149	26.56	150.3	3.82	2.51	1474.
175	5.53	33.78	174	26.67	140.1	4.18	3.10	1474.
200	5.16	33.79	199	26.73	135.2	4.53	3.76	1473.
225	4.89	33.82	223	26.78	130.3	4.86	4.48	1473.
250	4.68	33.85	248	26.82	126.0	5.18	5.25	1472.
300	4.37	33.91	298	26.91	118.6	5.79	6.96	1472.
400	4.02	34.00	397	27.01	109.4	6.92	11.01	1472.
500	3.80	34.06	496	27.08	103.2	7.99	15.88	1473.
600	3.65	34.15	595	27.17	95.4	8.98	21.42	1474.
800	3.29	34.29	793	27.31	82.9	10.74	33.99	1476.
1000	3.01	34.37	990	27.41	74.6	12.33	48.47	1478.
1200	2.68	34.45	1188	27.50	66.7	13.73	64.21	1480.



OFFSHORE OCEANOGRAPHY GROUP

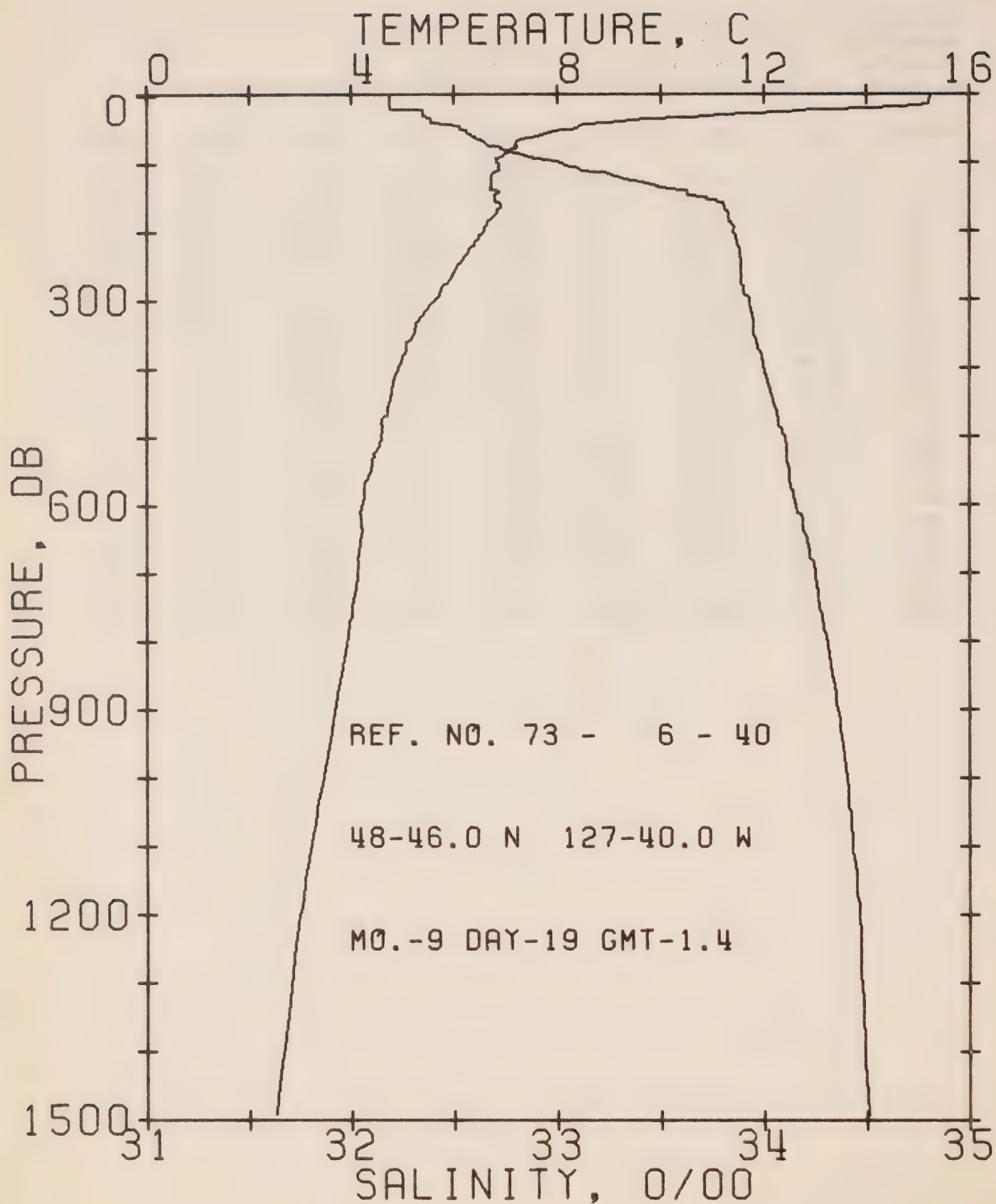
REFERENCE NO. 73- 6- 39

DATE 18/ 9/73

POSITION 49-10.0N, 132-40.0W GMT 11.5

RESULTS OF STD CAST 124 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.99	32.57	0	24.13	379.9	0.0	0.0	1504.
10	14.99	32.57	10	24.13	380.4	0.38	0.02	1505.
20	14.90	32.58	20	24.15	378.4	0.76	0.08	1504.
30	13.24	32.58	30	24.50	345.6	1.13	0.17	1499.
50	9.69	32.52	50	25.17	281.5	1.73	0.41	1487.
75	9.05	32.63	75	25.28	271.5	2.42	0.85	1483.
100	7.60	32.67	99	25.53	248.0	3.07	1.43	1480.
125	6.56	33.00	124	25.93	210.0	3.65	2.09	1477.
150	5.99	33.54	149	26.43	163.3	4.11	2.74	1476.
175	5.96	33.75	174	26.59	147.7	4.49	3.37	1476.
200	5.82	33.79	199	26.65	142.9	4.85	4.06	1476.
225	5.57	33.82	224	26.70	138.2	5.21	4.82	1475.
250	5.24	33.82	243	26.74	134.6	5.55	5.65	1474.
300	4.61	33.86	298	26.84	125.0	6.19	7.46	1473.
400	4.05	33.97	397	26.98	112.0	7.38	11.69	1472.
500	3.81	34.04	496	27.07	104.3	8.46	16.63	1473.
600	3.65	34.14	595	27.16	96.4	9.46	22.24	1474.
800	3.35	34.26	793	27.29	85.3	11.29	35.21	1476.
1000	3.07	34.35	991	27.39	76.9	12.91	50.06	1478.
1200	2.74	34.44	1188	27.48	68.2	14.35	66.22	1480.



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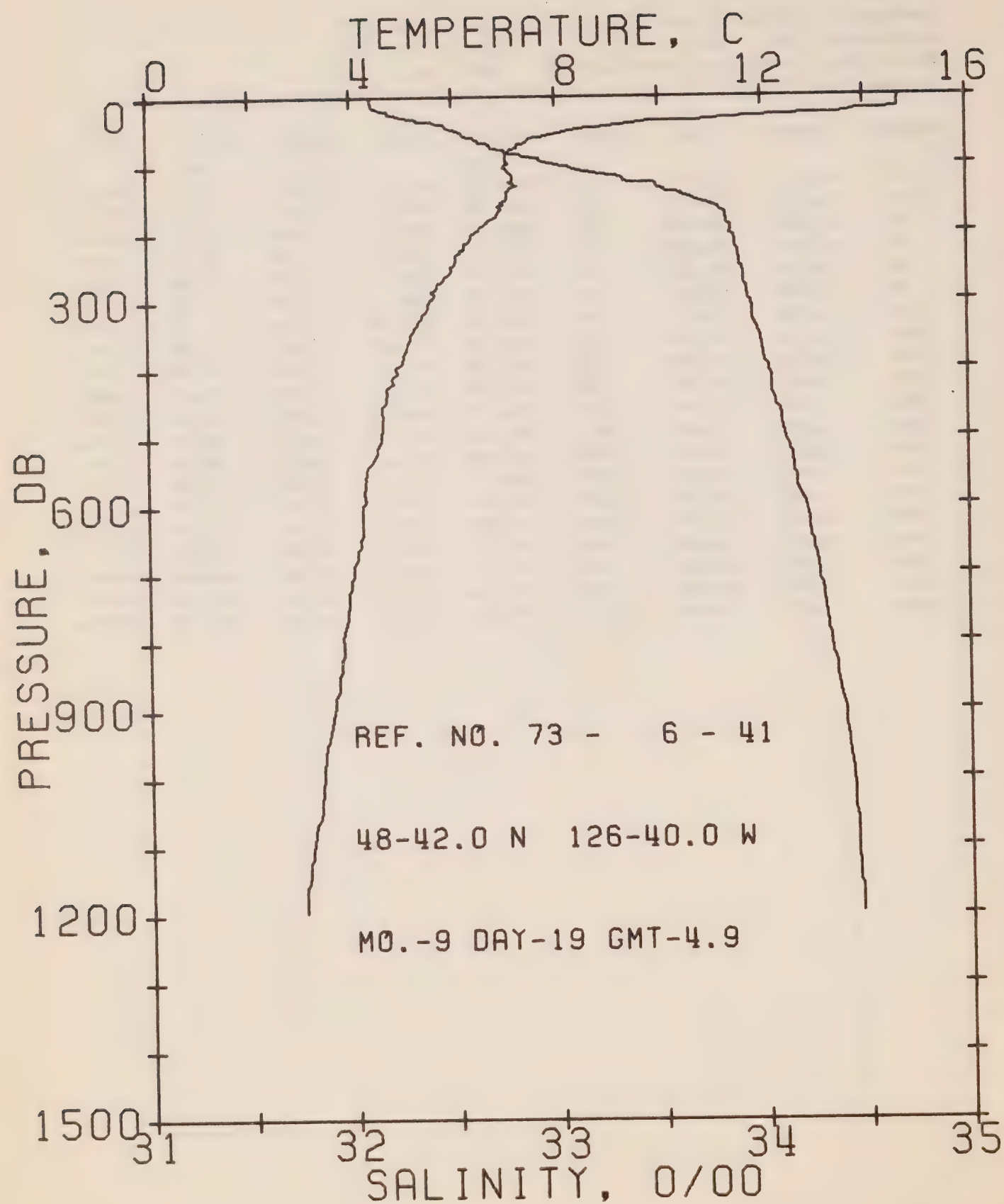
REFERENCE NO. 73- 6- 40

DATE 19/ 9/73

POSITION 48-46.0N, 127-40.0W GMT 1.4

RESULTS OF STP CAST 236 PCINTS TAKEN FROM ANALCG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	PCT. EN	SOUND
0	15.23	32.19	0	23.78	412.7	0.0	0.0	1505.
10	15.20	32.19	10	23.79	412.6	0.41	0.02	1505.
20	14.02	32.19	20	24.04	389.1	0.82	0.08	1501.
30	11.17	32.35	30	24.71	325.3	1.17	0.17	1492.
50	8.37	32.53	50	25.31	268.6	1.76	0.41	1482.
75	7.16	32.67	75	25.59	242.0	2.39	0.81	1478.
100	6.84	33.01	99	25.90	212.8	2.96	1.32	1477.
125	6.72	33.34	124	26.18	186.7	3.46	1.89	1478.
150	6.79	33.69	149	26.44	162.2	3.90	2.50	1479.
175	6.82	33.83	174	26.54	152.6	4.29	3.15	1480.
200	6.58	33.85	199	26.60	148.0	4.66	3.86	1479.
225	6.32	33.88	223	26.65	143.2	5.03	4.65	1479.
250	6.07	33.89	248	26.69	139.4	5.38	5.51	1478.
300	5.66	33.93	298	26.77	132.0	6.06	7.42	1477.
400	4.91	34.00	397	26.92	119.2	7.31	11.87	1476.
500	4.59	34.10	496	27.03	108.9	8.45	17.08	1476.
600	4.20	34.15	595	27.11	101.5	9.50	22.97	1476.
800	3.90	34.30	793	27.27	88.5	11.40	36.43	1479.
1000	3.43	34.40	991	27.39	77.4	13.05	51.57	1480.
1200	2.97	34.46	1188	27.48	69.1	14.51	67.93	1481.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 6- 41

DATE 19/ 9/73

POSITION 48-42.0N, 126-40.0W GMT 4.9

RESULTS OF STP CAST 243 PCINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA C	POT. EN	SOUND
0	14.71	32.10	0	23.83	408.7	0.0	0.0	1503.
10	14.66	32.10	10	23.84	407.9	0.41	0.02	1503.
20	14.31	32.15	20	23.95	397.7	0.81	0.08	1502.
30	12.09	32.24	30	24.46	349.1	1.19	0.18	1495.
50	8.37	32.51	50	25.29	269.7	1.79	0.42	1482.
75	7.25	32.69	75	25.59	241.6	2.42	0.82	1478.
100	7.08	33.00	99	25.86	216.7	2.99	1.33	1478.
125	7.12	33.34	124	26.12	191.9	3.50	1.91	1479.
150	7.07	33.66	149	26.38	168.0	3.94	2.53	1480.
175	6.86	33.82	174	26.53	153.7	4.34	3.19	1480.
200	6.45	33.84	199	26.61	146.9	4.71	3.90	1479.
225	6.18	33.88	223	26.67	141.2	5.07	4.68	1478.
250	5.97	33.89	248	26.70	138.2	5.42	5.52	1478.
300	5.51	33.94	298	26.80	129.4	6.09	7.40	1477.
400	4.86	34.03	397	26.95	116.1	7.32	11.79	1476.
500	4.56	34.11	496	27.04	107.9	8.44	16.91	1476.
600	4.20	34.20	595	27.15	97.8	9.47	22.64	1476.
800	3.78	34.32	793	27.29	85.8	11.30	35.67	1478.
1000	3.35	34.42	991	27.42	74.9	12.90	50.31	1480.

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 6- 42

DATE 19/ 9/73

POSITION 48-38.0N, 126- 0.0W GMT 7.8

RESULTS OF STP CAST 52 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.86	32.36	0	24.59	335.7	0.0	0.0	1494.
10	11.87	32.36	10	24.59	336.3	0.34	0.02	1494.
20	8.42	32.78	20	25.49	250.2	0.62	0.06	1482.
30	8.04	32.84	30	25.60	240.6	0.86	0.12	1481.
50	7.36	33.25	50	26.02	200.6	1.30	0.30	1479.
75	6.78	33.55	75	26.33	171.4	1.77	0.60	1477.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	11.86	32.36	44.	7.46	33.19
1.	11.80	32.36	44.	7.44	33.20
3.	11.85	32.36	45.	7.41	33.23
10.	11.87	32.36	51.	7.35	33.26
11.	11.17	32.36	53.	7.30	33.30
12.	10.45	32.37	55.	7.25	33.31
13.	10.19	32.50	58.	7.24	33.33
13.	9.94	32.51	59.	7.21	33.35
15.	9.40	32.55	62.	7.20	33.36
15.	9.30	32.57	62.	7.19	33.36
16.	9.11	32.61	64.	7.17	33.38
17.	9.05	32.62	66.	7.15	33.39
19.	8.66	32.67	66.	7.13	33.39
20.	8.42	32.78	69.	7.12	33.40
21.	8.20	32.80	71.	7.04	33.43
22.	8.13	32.83	73.	6.95	33.46
23.	8.09	32.83	73.	6.91	33.46
26.	8.07	32.84	75.	6.78	33.55
29.	8.07	32.84	76.	6.74	33.56
31.	8.02	32.84	80.	6.64	33.63
33.	7.84	32.91	81.	6.61	33.66
34.	7.83	32.91	82.	6.57	33.67
34.	7.83	32.94	83.	6.53	33.69
36.	7.76	32.99	86.	6.47	33.71
38.	7.72	33.02	88.	6.47	33.73
39.	7.59	33.12	89.	6.44	33.73

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 73- 6- 43

DATE 19/ 9/73

POSITION 48-33.0N, 125-33.0W GMT 9.5

RESULTS OF STP CAST 42 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.50	32.56	0	24.63	332.4	0.0	0.0	1496.
10	12.32	32.57	10	24.67	328.9	0.33	0.02	1496.
20	9.07	32.86	20	25.46	253.8	0.64	0.06	1485.
30	7.51	33.30	30	26.04	198.7	0.86	0.12	1479.
50	6.68	33.66	50	26.43	161.6	1.21	0.26	1477.
75	6.40	33.79	75	26.57	148.8	1.59	0.51	1476.

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	12.50	32.56	26.	7.87	33.15
0.	12.31	32.56	29.	7.74	33.19
1.	12.45	32.56	29.	7.71	33.24
2.	12.03	32.56	31.	7.32	33.37
4.	12.04	32.57	32.	7.18	33.41
5.	11.89	32.57	33.	7.14	33.46
5.	11.65	32.57	37.	6.94	33.52
7.	12.09	32.57	38.	6.92	33.54
9.	12.37	32.57	44.	6.80	33.60
11.	12.28	32.57	46.	6.73	33.63
13.	12.38	32.57	47.	6.71	33.64
15.	12.38	32.57	49.	6.69	33.66
15.	12.38	32.58	50.	6.68	33.66
16.	11.42	32.58	57.	6.54	33.72
17.	11.62	32.59	58.	6.54	33.72
18.	10.30	32.64	68.	6.46	33.76
19.	9.80	32.69	70.	6.44	33.77
19.	9.39	32.83	78.	6.38	33.80
20.	9.07	32.86	80.	6.37	33.81
22.	8.69	32.96	88.	6.33	33.82
24.	8.34	33.08	90.	6.32	33.82

SURFACE TEMPERATURE AND SALINITY OBSERVATIONS

(P-73-6)

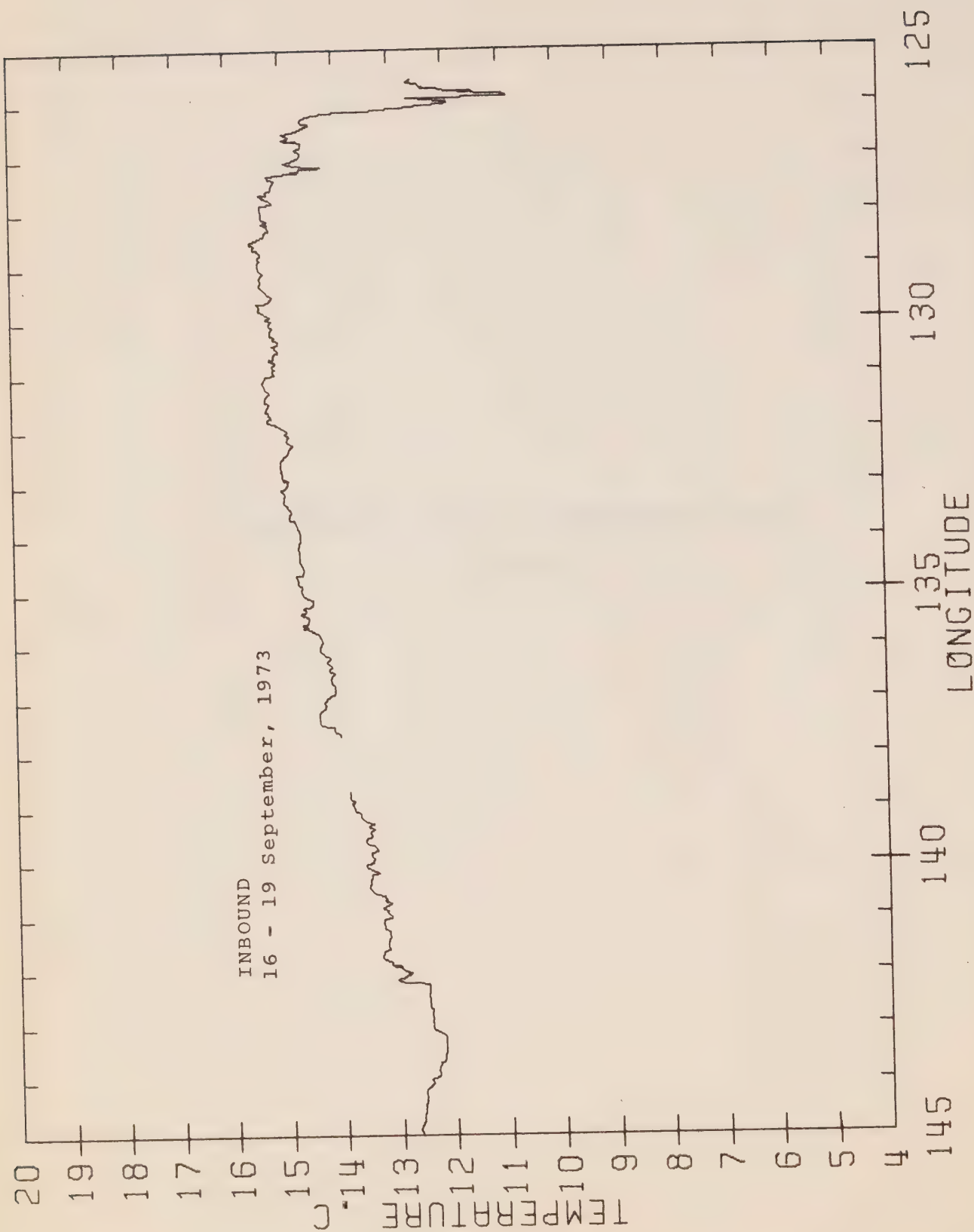


Figure 14 Surface temperature along Line P recorded from engine room intake. P-73-6.

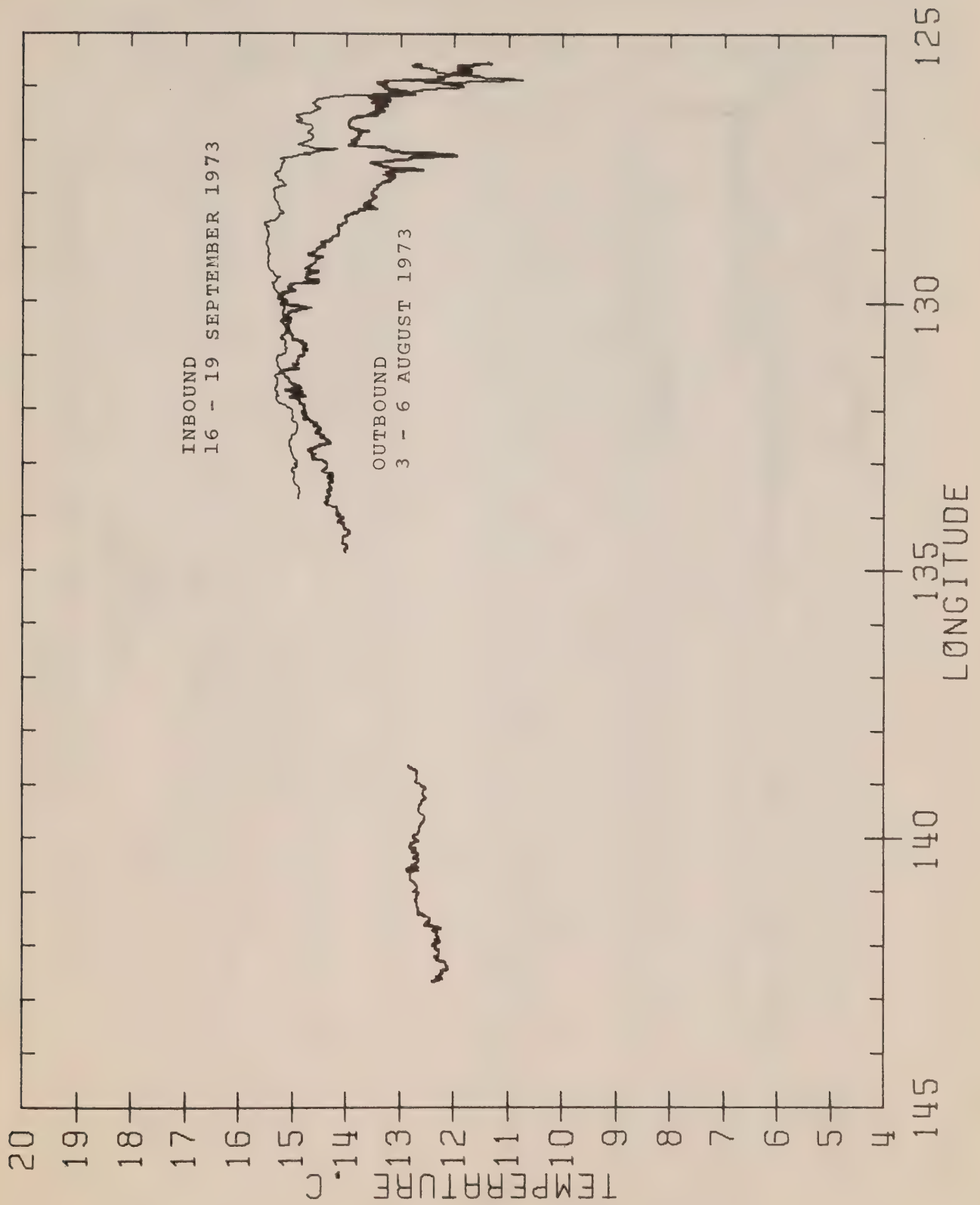


Figure 15 Surface temperature along Line P recorded from thermalino-graph. P-73-6.

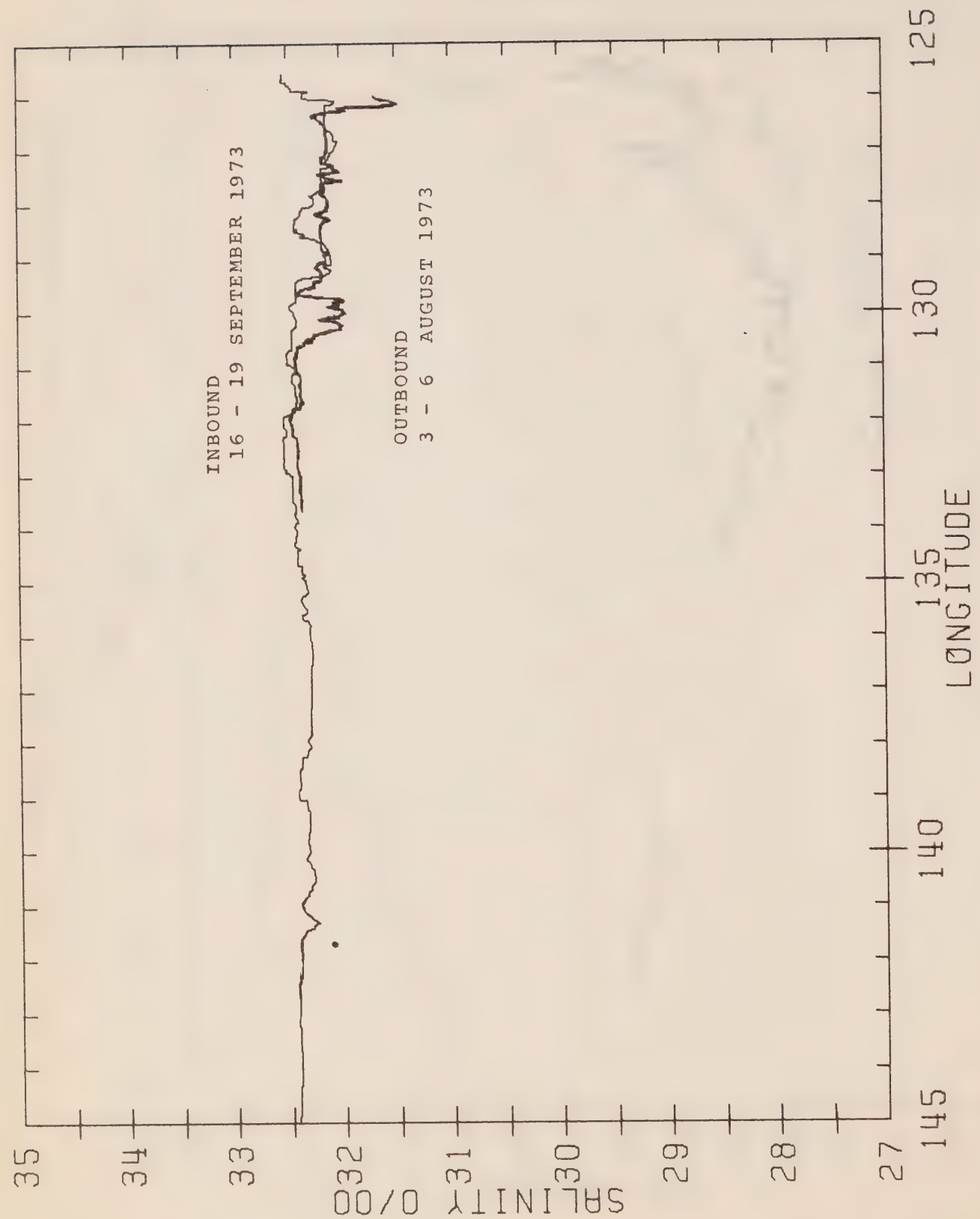


Figure 16 Surface salinity along Line P recorded from thermosalinograph. P-73-6.

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 6

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GMT	0/00	C	WEST
73	8	3	2225	31.618	11.4	125-33
73	8	4	15	31.692	13.3	126- 0
73	8	4	300	32.117	14.0	126-40
73	8	4	610	32.162	13.2	127-40
73	8	4	1015	32.179	14.2	128-40
73	8	4	1345	32.427	15.0	129-40
73	8	4	1645	32.396	15.0	130-40
73	8	4	2030	32.363	15.0	131-40
73	8	4	2330	32.419	14.5	132-40
73	8	5	240	32.409	14.4	133-40
73	8	5	600	32.362	14.0	134-40
73	8	5	900	32.349	13.8	135-40
73	8	5	1532	32.379	13.0	137-40
73	8	5	1800	32.402	12.0	138-40
73	8	5	2100	32.461	12.5	139-40
73	8	6	35	32.407	12.8	140-40
73	8	6	440	32.415	12.4	141-40
73	8	6	735	32.451	12.3	142-40
73	8	6	1200	32.451	12.2	143-40
73	8	7	0	32.480	12.0	145- 0
73	8	8	0	32.471	12.1	ON STATION
73	8	9	0	32.477	12.1	ON STATION
73	8	10	0	32.456	12.3	ON STATION
73	8	11	0	32.464	12.4	ON STATION
73	8	12	0	32.457	12.3	ON STATION
73	8	13	0	32.466	12.4	ON STATION
73	8	14	0	32.467	12.4	ON STATION
73	8	15	0	32.480	12.5	ON STATION
73	8	16	0	32.474	12.7	ON STATION
73	8	17	0	32.471	12.5	ON STATION
73	8	18	0	32.479	12.7	ON STATION
73	8	19	0	32.482	12.6	ON STATION
73	8	20	3	24.731	25.0	ON STATION
73	8	21	0	32.474	12.5	ON STATION
73	8	22	0	32.470	12.6	ON STATION
73	8	23	0	32.452	12.5	ON STATION
73	8	24	0	32.471	12.6	ON STATION
73	8	25	0	32.460	12.6	ON STATION
73	8	26	0	32.461	12.7	ON STATION
73	8	27	0	32.460	12.5	ON STATION
73	8	28	0	32.463	13.0	ON STATION
73	8	29	0	32.467	12.8	ON STATION
73	8	30	0	32.466	12.7	ON STATION
73	8	31	0		12.7	ON STATION
73	9	1	0	32.468	12.7	ON STATION

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 73- 6

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DAY	GMT	0/00	C	WEST
73	9	1	0	32.468	12.7	ON STATION
73	9	2	0	32.452	12.6	ON STATION
73	9	3	0	32.464	12.8	ON STATION
73	9	4	0	32.449	12.8	ON STATION
73	9	5	0	32.491	12.8	ON STATION
73	9	6	0	32.460	12.7	ON STATION
73	9	7	0	32.467	12.5	ON STATION
73	9	8	0	32.484	12.0	ON STATION
73	9	9	0	32.512	12.8	ON STATION
73	9	10	0	32.454	12.8	ON STATION
73	9	11	0	32.451	12.8	ON STATION
73	9	12	0	32.455	12.6	ON STATION
73	9	13	0	32.458	12.6	ON STATION
73	9	14	0	32.463	12.7	ON STATION
73	9	15	0	32.463	12.7	ON STATION
73	9	16	2330	32.424	12.4	143-40
73	9	17	355	32.440	12.5	142-40
73	9	17	745	32.387	13.4	141-40
73	9	17	1100	32.323	13.3	140-40
73	9	17	1320	32.324	13.6	139-40
73	9	17	1600	32.419	13.9	138-40
73	9	17	2000	32.313	14.0	137-40
73	9	17	2300	32.294	14.2	136-40
73	9	18	230	32.398	14.6	135-40
73	9	18	515	32.430	14.8	134-40
73	9	18	830	32.459	14.8	133-40
73	9	18	1115	32.558	15.0	132-40
73	9	18	1445	32.419	15.3	131-40
73	9	18	1720	32.486	15.1	130-40
73	9	18	1950	32.436	15.3	129-40
73	9	18	2230	32.232	15.5	128-40
73	9	19	152	32.180	15.3	127-40
73	9	19	450	32.098	14.8	126-40
73	9	19	750	32.358	12.0	126- 0
73	9	19	930	32.556	12.5	125-32

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